

# Poster presentation abstract

## English presentation session

### Children and Adolescents

Presentation No. : E\_OTP001

Submission No. : 1130048

自閉症類群障礙症家長執行情緒行為介入回顧

## Parent-Implemented Emotional Regulation Interventions for Preschool Children with ASD: A Systematic Review

Yu-Ling, Chen<sup>1</sup> Chen-Ling, Lai<sup>1</sup>

<sup>1</sup> Department of Occupational Therapy, Rehabilitation Medicine Division, Taoyuan General Hospital, Ministry of Health and Welfare, Taoyuan, Taiwan

**Background:** Children with Autism Spectrum Disorder (ASD) are more prone to experiencing emotional and behavioral challenges than their neurotypical peers. They often face delays in developing emotion regulation strategies. These challenges, frequently linked to emotional dysregulation, affect social interactions, overall development, and daily functioning. Given the crucial role of daily parent-implemented interventions for preschoolers with ASD, it is concerning that no systematic reviews have summarized the evidence on their effectiveness in improving emotional regulation and addressing challenging behaviors by parent-implemented. Therefore, this systematic review aims to fill this gap by evaluating the existing research on parent-implemented interventions and their impact on emotional and behavioral outcomes in preschool children with ASD.

**Method:** This systematic review examines emotional regulation and challenging behavior interventions for preschoolers with ASD, with a focus on parent-implemented. Using keywords related to emotional regulation, challenging behaviors, parent-implemented, preschool children, and ASD, studies published from 2014 to 2024 were searched in PubMed, Medline, CINAHL, EMBASE, Web of Science, and Cochrane databases. Inclusion criteria encompassed studies targeting emotional regulation interventions through parents for preschoolers with ASD, employing empirical methodologies, detailing intervention techniques, reporting relevant outcomes, and publishing in peer-reviewed sources, available in English. Exclusions involved studies focusing on older individuals, lacking intervention specificity or outcome measurement, and inaccessible texts. This review aims to synthesize evidence-based emotional regulation practices for preschoolers with ASD.

**Results:** In total, eleven studies on parent-implemented emotional regulation and challenging behavior interventions were included in this systematic review. The intervention included Functional Communication Training (FCT), Prevent-Teach-Reinforce (PTR), Stress and Anger Management Program (STAMP), and parenting training. More than half of the studies utilized FCT, which was shown to reduce escape-maintained problem behaviors and improve communication. Additionally,

FCT was found to be effective when delivered via telehealth. STAMP focused on providing strategies for managing stress and anger, contributing to improved emotional regulation. The parenting training combined different strategies to manage disruptive behavior, enhancing overall emotional and behavioral outcomes. However, eight studies had small sample sizes, and only three studies provided effect sizes: FCT (Cohen's  $d=1.57$ ), PTR (partial  $\eta^2=0.18-0.27$ ), and parent training (effect size=0.62).

**Conclusions:** This systematic review highlights the effectiveness of parent-implemented interventions in improving emotional regulation and reducing challenging behaviors in preschool children with ASD. Interventions such as FCT and STAMP show promise, particularly when adapted for telehealth delivery. Despite the small sample sizes in many studies, the reported effect sizes suggest meaningful improvements. Future research should focus on larger sample sizes and long-term outcomes to further validate these findings and enhance the evidence base for parent-implemented interventions in this population. Additionally, there is a need for more comprehensive reporting of intervention techniques and outcomes to facilitate replication and practical application.

**Keywords :** children, autism spectrum disorder, emotional regulation, behavioral problems, parent-implemented, intervention

**Corresponding author :** YuLingChen

**E-mail :** judy40924@gmail.com

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### **Development of the Autism Mealtime Behavior Questionnaire for Children with Autism Spectrum Disorder**

Tien-Ni Wang<sup>1</sup> Tzu-Min Lee<sup>2</sup> Ya-Lin Hsieh<sup>2</sup> Wen-Hsin Lai<sup>2</sup>

<sup>1</sup> School of Occupational Therapy, College of Medicine, National Taiwan University, Taipei, Taiwan

<sup>2</sup> Department of Psychiatry, National Taiwan University Hospital, Taipei, Taiwan

**Introduction :** Feeding problems are common among children, affecting both typically developing kids and those with developmental disabilities. Children with Autism Spectrum Disorder (ASD) often experience feeding difficulties, which might link to their core syndromes (sensory sensitivities, behavioral rigidity, and social challenges). These problems can exacerbate health issues and developmental delays. In order to gain a more comprehensive understanding of the eating behaviors of children with autism, the purpose of this study is to develop a valid and reliable assessment, named Autism Mealtime Behavior Questionnaire (AMBQ).

**Methods:** The AMBQ comprises 23 items assessing various mealtime behaviors such as eating characteristics, picky eating, behavioral issues, and mealtime flexibility. Each item includes scores for behavior frequency and parental distress level related to that behavior. 50 participants with children aged from 2 to 7 years and diagnosed with ASD were recruited. Internal consistency, test-retest reliability, and convergent validity were evaluated. The Brief Autism Mealtime Behavior

Inventory (BAMBI) served as a criteria measure for assessing convergent validity.

**Results:**The AMBQ demonstrated excellent internal consistency for both frequency (Cronbach's alpha = 0.908) and distress (Cronbach's alpha = 0.917) scores. Test-retest reliability was excellent for frequency (ICC = 0.937) and good for distress (ICC = 0.874). Convergent validity was supported by moderate to large significant correlations with BAMBI ( $r = 0.579, p < 0.001$  for frequency;  $r = 0.825, p < 0.001$  for distress).

**Conclusion:**The findings confirm that the AMBQ is a reliable and valid questionnaire-based assessment tool for measuring mealtime behaviors and corresponding parental distress level in children with ASD.

**Keywords :** feeding, assessment, psychometric properties

**Corresponding author :** 謝雅琳

**E-mail :** veronica01222@gmail.com

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**Presentation No. :** E\_OTP003

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嬰幼兒按摩於早產兒及其照顧者之效益初探

**Exploring the Benefits of Infant Massage for Preterm Infants and Their Caregivers: A Preliminary Study**

吳宜臻<sup>1</sup> 戴鳳琳<sup>1</sup> 劉宜佳<sup>2</sup>

<sup>1</sup> 亞東紀念醫院

<sup>2</sup> 衛生福利部臺北醫院

**Background and Objectives:** Infant massage, which integrates principles of massage, yoga, and reflexology, has been shown to offer numerous benefits for both infants and caregivers by providing nurturing touch. However, there is limited research specifically addressing the benefits of infant massage for preterm infants. This study aimed to investigate the effects of infant massage on preterm infants and their caregivers.

**Methods:** This study was conducted by an occupational therapist certified by the Infant Massage Association, who organized an "Infant Massage Group." The participants included preterm infants with a corrected age of under one year, along with their caregivers. The group sessions lasted five weeks, with each session lasting two hours and covering introductory activities, icebreakers, hands-on massage techniques, theory, discussions, and wrap-up. Preterm infants participating in the group also received regular occupational therapy. A self-developed questionnaire, comprising the "Infant Massage Questionnaire" and "Satisfaction Questionnaire," was used to assess the effectiveness of infant massage and caregivers' satisfaction. The Infant Massage Questionnaire consisted of two parts: one for infants and one for caregivers. Infant-related questions covered sleep and wake patterns, frequency of gastrointestinal issues, environmental sensitivity, emotional stability, verbal and non-verbal communication, and muscle condition. Caregiver-related questions included understanding of the baby's temperament, intimacy and attachment with the baby, and confidence in

caring for the baby. Responses were rated on a seven-point Likert scale and administered before and after the group sessions by caregivers. The Wilcoxon Signed-Rank Test was used to assess the differences between pre- and post- test results of Infant Massage Questionnaire. The Satisfaction Questionnaire evaluated caregiver satisfaction with the group activities and collected qualitative feedback.

**Results:** Seven parent-infant pairs participated in the group and completed the questionnaires. Infant ages ranged from 0.5 to 6 months. Results of the Infant Massage Questionnaire showed a significant improvement in "overall emotional stability" from 4.86 to 6.00 ( $p = 0.038$ ). Although other scores did not reach statistical significance, post-session scores showed an increasing trend compared to pre-session scores. Results of the Satisfaction Questionnaire indicated that all seven caregivers were highly satisfied with the group. Qualitative feedback highlighted infants' enjoyment of massage, increased sleep duration, and improved tactile sensitivity, relaxation, and bonding between caregiver and infant.

**Conclusion and Discussion:** The findings suggest that infant massage provides numerous benefits for premature infants and their caregivers, with a significant effect on improving infant emotional stability. Other positive outcomes, such as improved sleep patterns, reduced sensitivity, and enhanced parent-child attachment, although not statistically significant, were evident from qualitative feedback. All participating caregivers expressed high satisfaction with the massage group. Infant massage could be considered as an adjunctive intervention alongside standard occupational therapy for premature infants to enhance emotional stability, sleep patterns, environmental adaptation, and caregiver confidence. However, given the small sample size and subjective nature of questionnaire responses, future research could incorporate randomized controlled trials and standardized assessments to further validate efficacy.

**Keywords :** Infant massage, Preterm infants, Caregivers, Benefits, Occupational therapy

**Corresponding author :** 劉宜佳

**E-mail :** breeze040612@gmail.com

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**Presentation No. :** E\_OTP004

**Submission No. :** 1130134

**Facial Emotion Recognition in Children with Autism Spectrum Disorder: Perspectives from Weak Central Coherence Theory**

Cherng-I Chou <sup>1</sup> Chien-Te Wu <sup>2</sup> Hao-Ling Chen <sup>3</sup> Tien-Ni Wang <sup>3</sup>

<sup>1</sup> National Taiwan University Children's Hospital

<sup>2</sup> International Research Center for Neurointelligence, University of Tokyo

<sup>3</sup> Department of Occupational Therapy, National Taiwan University

**Background :** Facial emotion recognition (FER) is crucial for understanding others' emotions. It poses challenges for individuals with autism spectrum disorders (ASD) due to their preference for local visual processing over global patterns, a cognitive style explained by weak central coherence

(WCC). Previous research suggests that ASD children who adopt less local-oriented strategies may perform better in FER tasks, highlighting the impact of visual processing styles on emotion recognition. However, these findings lack comprehensive and naturalistic experimental settings. This study aims to compare FER performance between children with ASD and their age-matched peers and explore how WCC theory interprets differences in their performance.

**Methods :** School-aged children with typical development and ASD participated in a FER task involving three conditions: baseline, uncovered (emphasizing whole-face processing), and covered (featuring limited facial features). Performance was assessed based on accuracies and reaction times recorded during the task.

**Results :** Fifteen school-aged children with ASD and typical development (TD) were recruited. Significant differences in accuracies were observed between groups, particularly in the baseline and uncovered conditions, where the TD group performed better than the ASD group. No significant group difference was found in covered condition. Additionally, there were no significant differences in reaction times across any of the conditions

**Discussion** This study investigated how school-aged children with ASD differ from their TD peers in recognizing facial emotions. Children with ASD showed lower accuracy in identifying complete facial expressions, which aligns with the WCC theory. They tended to focus more on analyzing isolated facial features rather than integrating overall emotional cues. This suggests that interventions could capitalize on these analytical strengths to improve social interaction skills in children with ASD. Further research with larger samples is needed to refine therapeutic approaches based on these findings.

**Keywords :** facial emotion recognition, autism spectrum disorders, weak central coherence

**Corresponding author :** 周承毅

**E-mail :** caflys8697@gmail.com

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**Presentation No. :** E\_OTP005

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腦性麻痺孩童觸覺功能與上肢動作品質之關聯

**Relationship Between Tactile Function and Quality of Upper Limb Movement in Children with Cerebral Palsy**

Tien-Ni Wang<sup>1</sup> Ai-Rung Tsai<sup>1</sup> Kai-Jie Liang<sup>23</sup> Hao-Ling Chen<sup>1</sup>

<sup>1</sup> School of Occupational Therapy, College of Medicine, National Taiwan University, Taipei, Taiwan

<sup>2</sup> Department of Occupational Therapy, College of Medical Science and Technology, Chung Shan Medical University, Taichung, Taiwan.

<sup>3</sup> Occupational Therapy Room, Chung Shan Medical University Hospital, Taichung, Taiwan

Children with Cerebral Palsy (CP) often encounter sensorimotor challenges that impact their daily activities. Sensory function, particularly tactile functions, is crucial for motor performance. Recently, the Manual Ability Classification System (MACS) has become crucial in evaluating these movement

challenges, targeting interventions, and improving outcomes. Thus, the purpose of this study was to investigate the relationship between tactile function and upper limb movement in children with CP, using MACS for classification.

Eighty-nine children with CP (42 girls, 47 boys, aged 5 to 13, average 8.72) participated in this study. Participants were categorized by their MACS level into two groups: mildly impaired group (MACS I) and impaired group (MACS II-VI). Tactile function was assessed by the Semmes-Weinstein monofilament (SWM), moving and static two-point discrimination (MTPD, STPD), and the Tactile Perception Test (TPT) for investigating stereognosis, roughness, hardness, and heaviness. Upper limb movement function was measured by the Melbourne Assessment 2 (MA2) which consists of four domains: range of motion (ROM), fluency, accuracy, and dexterity. Stepwise multiple linear regression analyses were conducted to investigate if various types of tactile function could explain the variance of upper limb movement quality in children with CP.

In the mildly impaired group, roughness accounted for 10% of the variation in ROM, hardness for 7% of the variation in dexterity, and both stereognosis and hardness together explained 21% of the variation in fluency. In the impaired group, STPD and stereognosis explained 67% of the variation in ROM and 63% of the variation in dexterity. Additionally, hardness, STPD, and SWM together accounted for 81% of the variation in accuracy, and STPD, stereognosis, and heaviness explained 67% of the variation in fluency.

This study indicates that different aspects of tactile function contribute to explaining the variance in upper limb movement quality in children with CP. In the impaired group, both stereognosis and STPD, as forms of spatial perception, significantly influence overall upper limb movement quality. In the mildly impaired group, unique texture perceptions like hardness partially explain variations in upper limb movement. These findings highlight the need for intervention plans to consider and address specific tactile functions based on the child's MACS level. These insights are crucial for guiding clinical assessments and developing targeted treatment strategies for children with CP.

**Keywords : Sensory, Motor Performance, Pediatric**

**Corresponding author : 王滢妮**

**E-mail : tnwang@ntu.edu.tw**

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**The Impact of Home Environment Enrichment on Visual Function Development in Preterm Infants**

石湘緹<sup>1</sup> 黃湘涵<sup>1,2,3</sup> 黃慶凱<sup>4</sup>

<sup>1</sup> 長庚大學職能治療系暨臨床行為科學研究所

<sup>2</sup> 長庚大學職能治療學系

<sup>3</sup> 長庚醫療財團法人林口長庚紀念醫院復健科

<sup>4</sup> 長庚醫療財團法人林口長庚紀念醫院復健科職能治療組

**Background and Objectives:** Visual is crucial for babies as they explore and gather information about their environment and themselves. The development of visual functions is influenced by the enrichment of their surroundings. This study examines the visual function at 31 to 37 weeks of PMA, 1 month and 3 months CA in premature infants, as well as the correlation between their home environment and visual development.

**Methods:** 56 participants underwent visual function assessments in the NICU. Among them, 38 were tracked for visual function development at one month of CA, and a total of 42 participants completed visual assessments and filled out a questionnaire about the enrichment of their home environment at three months of CA.

**Results:** Over 90% of preterm infants showed a mature pattern of ocular movements, fixation, horizontal tracking, and tracking colored targets at the age before 37 weeks of PMA. Over time, participants' visual functions developed further, particularly in vertical and arc tracking, stripe discrimination, and attention at distance. In addition, greater diversity of stimuli in the environment significantly correlated with improved distant attention.

**Discussion and Conclusion:** The findings reveal that preterm infants aged between 34 and 37 weeks of PMA exhibit mature ocular movements, fixation, tracking horizontally and tracking colored targets. It is primarily associated with subcortical functions. Vertical and arc tracking also relies on subcortical functions, potentially involving extraocular muscles whose development can be accelerated with increased visual experience. Stripe discrimination and attention at distance, however, are likely associated with cortical functions, which mature alongside enhanced visual interaction and cerebral cortex development as infants grow older. Enhancing the richness of the home environment may contribute to the development of visual function in premature infants. However, further investigation is required to determine whether the way or frequency of exposure to the environment or toys influences visual function. In summary, this study provides information about visual function of preterm infants in Taiwan. Future research should expand sample sizes and explore potential interactions between visual experience, neurological development, and enrichment of home environment. This will enable us to offer more precise interventions and home recommendations that support comprehensive development in preterm infants.

**Keywords :** preterm infants, visual test battery, visual function, visual perception, enrichment of home environment

**Corresponding author :** 石湘緹

**E-mail :** hsiangttt0118@gap.cgu.edu.tw

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不同動作遲緩嚴重程度孩童於優化電動車訓練中之環境知覺訊息

**Perceived Environmental Information during Optimal Ride-on Car Training in Children with Different Severity Levels of Motor Delays**

蕭右欣<sup>1</sup>、石湘緹<sup>1</sup>、黃湘涵<sup>123</sup>

<sup>1</sup>長庚大學職能治療系暨臨床行為科學研究所

<sup>2</sup>長庚大學職能治療學系

<sup>3</sup>長庚醫療財團法人林口長庚紀念醫院復健科

**Introduction:** Modified ride-on car (ROC) facilitates children with motor delays to perceive environmental information without limitation. Previous studies have evidenced the benefits in mobility, social functions, and goal achievements with different postures. This study aimed to investigate what children perceive during the training and to compare training effects based on motor delay severity.

**Method:** Eight participants completed the training, utilizing different posture modes based on their severity of motor delays: the ROC-Stand(Mild) group (n=2), the ROC-Stand25 (Mod) group (n=4), and the ROC-Sit(Sev) group (n=2). The head-mounted eye tracker was used to collect visual perception. Their mobility, social functions, and goal achievements were evaluated with the Chinese Version of the Pediatric Evaluation of Disability Inventory and Goal Attainment Scaling.

**Results:** With behavioral coding, their looking behaviors increased after training, particularly in their exploratory and social looking. The correlation analysis showed no direct relationships between their visual fixations and mobility and social functions. Besides, all participants improved in their mobility (p=.001), social functions (p=.004), and goal achievements (p<.001), without significant between-group differences.

**Conclusion:** ROC training tended to facilitate visual exploration and social looking for children with motor delays. The optimal training based on the severity of motor delays seemed equally beneficial in their mobility, social functions, and goal achievements. Further research should consider a larger sample size and higher quality of eye-tracking recording for profound insight into this topic.

**Keywords :** head-mounted eye tracking, ride-on car training, motor delay, perception-action framework

**Corresponding author :** 蕭右欣

**E-mail :** a0983488641@gmail.com

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**Presentation No. :** E\_OTP008

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**Investigating the association between maternal coping behaviors and early childhood development: A study protocol**

黃柏菁<sup>1</sup> 林宗瑩<sup>2</sup> 張芸瑄<sup>3</sup> 杜杏芬<sup>4</sup> 陳昭縈<sup>1</sup>

<sup>1</sup>長庚大學物理治療學系

<sup>2</sup>成功大學健康照護科學所

<sup>3</sup>成功大學老年學研究所

<sup>4</sup>Department of Psychology, Uppsala University



According to Fetal Programming Hypothesis and Bronfenbrenner's Bioecological System Theory, mothers can have substantial impacts on their babies in multiple domains through the prenatal and postnatal connection. The present work reports a study protocol in investigating three types of maternal coping behaviors on early childhood outcomes.

The benefit of physical activity is well-documented: Previous evidence indicated that no association was found between physical activity during pregnancy and 'clinically' low or high birthweight of infants. But maternal physical activity was reported to associate with cardiopulmonary function, motor development and personal-social skills of infants. Additionally, the intensity and timing of exercise were reported to influence infants' anthropometric measures (e.g., body composition or head circumference).

'Technoference' refers to parental smartphone use that interrupts the parent-children interaction. Infants who experienced technoference were reported with higher negative affect, including protest behavior and externalizing behavior, and these changes were irreversible even after regaining the parents' attention. Additionally, parental smartphone use may evoke the psychophysiological stress response by increasing heart rate of infants. Moreover, technoference was reported to influence the critical language development factors, which may impact the language development of children. Eating disorder (ED) includes anorexia nervosa, bulimia nervosa, binge eating disorder and eating disorder not otherwise specified of purging type. Maternal ED was correlated with infants/children's difficult temperament of high anxiety levels, negative affectivity, lower extraversion and effortful control. Moreover, symptoms of ED were associated with infants' feeding difficulties and could be further mediated by maternal psychological distress. Importantly, infants with ED mothers were more likely to have poor language, motor and neuropsychological development.

Considering that the influence of these maternal coping behaviors may substantially impact the development of their offspring, sufficient intervention is needed to foster a healthy children growth. Currently, the present authors are working on a study longitudinally investigating the associations between maternal psychological factors (i.e., depression, anxiety, stress, trauma, and fear), maternal coping behaviors (i.e., physical activity, smartphone addiction, social media addiction, and eating disorder), and infant/children's developments (i.e., temperament, sleep, language, cognition, motor, social skill and food responsiveness). Questionnaires and instruments will be used for assessments at prepartum (third trimester) and postpartum (six months after delivery). Linear mixed-effect models and structural equation modeling will be employed to examine the relationships between study variables. The results are expected to provide comprehensive evidence of (i) how maternal psychological changes impact mothers' postpartum behaviors and (ii) how maternal coping behaviors affect infants' developmental outcomes. With long-term evidence, the findings may inform the development of strategies to improve maternal psychological health and strengthen the mother-infant relationship, subsequently enhancing the childhood development and reducing the burden of childcare.

**Keywords : maternal psychological distress, coping behavior, physical activity, smartphone use, eating disorder, early childhood development**

**Corresponding author : 黃柏菁**

**E-mail : hh780705@hotmail.com**

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**Presentation No. : E\_OT001**

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**探討學齡前自閉症兒童睡眠障礙、感覺處理與焦慮之關係**

**Relationship between Sleep Disturbances, Sensory Processing and Anxiety in Preschool Children with Autism Spectrum Disorder.**

楊善竹<sup>1</sup> 林玲伊<sup>1</sup>

<sup>1</sup> 國立成功大學

Rest and sleep are essential activities in our daily lives, enabling us to perform optimally. Children with Autism Spectrum Disorder (ASD) are particularly vulnerable, with up to 89.7% experiencing sleep disturbances. Additionally, sensory sensitivities are commonly observed in children with ASD and have been linked to anxiety. Given the high prevalence of sleep disturbances, sensory sensitivities, and anxiety, a single person can exhibit all these problems. Therefore, this study aims to investigate the relationship between sleep disturbances, sensory sensitivities, and anxiety in preschool children with ASD in Taiwan.

We recruited 25 preschool children with ASD (21 boys and 4 girls) whose scores were above 30 ( $M = 33.7$ ) on the Childhood Autism Rating Scale-Second Edition (CARS-2, standard version) and above 70 ( $M = 101.68$ ) on the Peabody Picture Vocabulary Test-Revised (PPVT-R). We detected different types of sleep disturbances using objective and subjective assessments such as actigraphy and the Children's Sleep Habits Questionnaire (CSHQ). We used nonparametric methods for data analysis.

The results showed that sensory sensitivities, anxiety, and night wakings are highly correlated. Sensory sensitivities show a moderate correlation with anxiety ( $r = 0.564, p = 0.003$ ), while anxiety is also correlated with night wakings ( $r = 0.608, p = 0.001$ ). Furthermore, sensory sensitivities are correlated with night wakings ( $r = 0.453, p = 0.023$ ). The mediation analysis demonstrates that sensory sensitivities significantly directly influenced Children's Sleep Habits Questionnaire (CSHQ) Sleep Anxiety. Heightened sensory sensitivities were associated with a 36% increase in CSHQ Sleep Anxiety levels. Sensory sensitivities are also linked to more frequent night wakings, accounting for 42% of the variations in night wakings. Furthermore, the frequency of night wakings, when controlling for sensory sensitivities, is significantly related to higher CSHQ Sleep Anxiety levels, explaining approximately 42% of the variations in CSHQ Sleep Anxiety. The indirect effect of sensory sensitivities on CSHQ Sleep Anxiety through night wakings is statistically significant, indicating that night wakings significantly mediate the relationship between sensory sensitivities and CSHQ Sleep Anxiety.

This study shows the importance of considering sensory processing difficulties and sleep disturbances when concerning anxiety among preschool children with ASD. Sensory sensitivities are associated with CSHQ Sleep Anxiety both directly and through the occurrence of night wakings, with night wakings playing a significant mediating role. Therapeutic interventions are required for preschool children with ASD to consider the presence of sensory sensitivities and sleep disturbances among some children with ASD to address their anxiety.

**Keywords :** #ASD #Sleep Disturbances #Sensory Sensitivities #Anxiety #Preschool Children

**Corresponding author :** 楊善竹

**E-mail :** phoebeyang1998@gmail.com

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**Presentation No. :** E\_OTs002

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### **Chinese Handwriting Legibility and Character Processing Skills in Children with Autism Spectrum Disorder**

翁芷琦<sup>1</sup> 張鎔麒<sup>2</sup> 王可青<sup>3</sup> 陳顥齡<sup>1</sup> 王湑妮<sup>1</sup>

<sup>1</sup> 國立台灣大學

<sup>2</sup> 國立臺灣大學醫學院附設醫院

<sup>3</sup> 臺北市中山國小

Handwriting is a crucial task for school-aged children, but it often presents challenges for those with autism spectrum disorders (ASD). An atypical processing pattern identified as weak central coherence (WCC) potentially affects the legibility of handwriting. However, there is limited research on the legibility of Chinese handwriting and WCC phenomena in children with ASD. Thus, this research study aimed to: (1) compare Chinese handwriting legibility between children with ASD and typically developing (TD) children, and (2) investigate the phenomenon of WCC in recognizing Chinese characters and the interaction between groups and character familiarity. This study included 30 children with ASD and 30 TD children from first or second grade. The Chinese Handwriting Legibility Assessment for Children evaluated handwriting legibility, and the Character Processing Test measured WCC effects on character recognition. Results indicated that children with ASD exhibit poorer legibility in Chinese handwriting, particularly in radical proportion and spacing ( $p = 0.009$  and  $0.046$ ). Children with ASD exhibited a local-focused processing pattern when handling unfamiliar characters ( $p = 0.004$ ), while processing of familiar characters did not significantly differ between groups.

**Keywords :** autism spectrum disorders, handwriting legibility, visual processing, weak central coherence

**Corresponding author :** 翁芷琦

**E-mail :** gigiweng0620@gmail.com

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**Presentation No. :** E\_OTs003

**Submission No. : 1130107**

**Outcome in children with stroke: A population-based cross-sectional study.**

Chai Yin Charlie Fan <sup>1</sup>

<sup>1</sup> Department of Paediatrics and Adolescent Medicine, The University of Hong Kong

Strokes can happen at any age, and it is named pediatric stroke when it happens in children or adolescents. Pediatric stroke can be mainly categorized into two types depending on the time of onset: perinatal if stroke occurs before one year of age, and childhood if stroke occurs between one to 18 years old. The aim of the study is to investigate the actual motor, cognitive, and psychological status and performance of childhood stroke survivors in Hong Kong. The relationships between different performance aspects would be explored. Childhood stroke survivors who age between 6 and 18 years old are recruited into the study. Using standardized motor, cognitive, and psychological measures, an occupational therapist and researchers utilized the Bruininks-Oseretsky Test of Motor Proficiency Second Edition (BOT-2) as a primary outcome measure for motor function, the Conners Continuous Performance Test 3rd Edition (CPT 3) and Raven's Progressive Matrices as cognitive outcome measures, Strength and Difficulties Questionnaire (SDQ) and the Pediatric Quality of Life Inventory (PedsQL) as psychological measures. This study is believed to provide valuable insights for healthcare professionals in the assessment and treatment of children with stroke, which could lead to improved outcomes and quality of life of this population.

**Keywords : Stroke, Children, Motor, Cognitive, Psychological, Outcome**

**Corresponding author : Chai Yin Charlie Fan**

**E-mail : charlifanchaiyin@gmail.com**

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**Presentation No. : E\_OT004**

**Submission No. : 1130186**

年輕成人握筆方式與手指捏力的初步研究

**Handwriting Grip Patterns and Finger Pinch Strength in Young Adults: A Preliminary Study**

林子馨 <sup>1</sup> 蘇湘晴 <sup>1</sup> 許絜翔 <sup>2</sup> 郭立杰 <sup>3</sup> 林宥岑 <sup>1</sup>

<sup>1</sup> 大葉大學職能治療學系

<sup>2</sup> 南臺科技大學機械工程學系

<sup>3</sup> 國立成功大學職能治療學系

**Purpose:** Handwriting is essential for school-age children to learn Chinese characters and adapt academically. Grip patterns are crucial for occupational therapists assessing motor development. However, studies on adult pen grip patterns are limited. This study investigates grip patterns and finger pinch strength in young adults.

**Method:** Twenty young adults (average age 20.1, SD = 5 years) were recruited using convenience sampling, with an equal gender ratio. Participants copied 50 characters using a ballpoint pen while their writing process was recorded on video. Three researchers classified grip patterns from the recordings. Finger pinch strength was measured using a B&L pinch gauge.

**Results:** Pinch strength measurements were as follows: lateral pinch (mean 7.7 kg, SD 2.0), palmar pinch (mean 7.4 kg, SD 2.2), and thumb adduction (mean 4.6 kg, SD 1.4), aligning with previous literature. Six grip patterns were identified: Dynamic tripod (5.0%), Lateral tripod (5.0%), Static tripod (5.0%), Locked grip with thumb tuck (55.0%), Locked grip with thumb wrap (5.0%), Lateral pinch grip (10.0%), Lateral quadrupod grip (5.0%), and Other (10.0%).

**Conclusion:** The most common grip pattern was the locked grip with thumb tuck, followed by the lateral pinch grip. This differs from children's grip studies, which often identified the Dynamic tripod as the most common. This study provides data on grip patterns in young adults grip patterns, useful for clinical training of adult patients. However, these findings cannot be generalized due to the small sample size, indicating a need for further research with larger samples.

**Keywords :** Handwriting; Grip type; Young adult

**Corresponding author :** 林宥岑

**E-mail :** yuchenl@mail.dyu.edu.tw

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## Physical Dysfunction

**Presentation No. :** E\_OTP009

**Submission No. :** 1130120

### Caregiver-Assisted Rehabilitation with Strategy Training (CAR-ST) for Stroke Survivors with Functional Limitations: Protocol for A Multi-Center, Randomized Trial

Shih-Pin Hsu<sup>1</sup> Tz-Ting Huang<sup>1</sup> Chi-Chen Chen<sup>1</sup> Feng-Hang Chang<sup>1</sup>

<sup>1</sup> Graduate Institute of Injury Prevention and Control, Taipei Medical University, New Taipei City, Taiwan

**Introduction and objectives:** There is a critical need for high-quality evidence to enhance post-stroke activity performance, particularly in real-life settings. Although intensive inpatient rehabilitation has proven effective, sustaining an optimal treatment regimen as patients transition to home remains challenging. Integrating caregivers into home-based, evidence-supported rehabilitation shows potential benefit, but its efficacy requires rigorous evaluation. This study aims to assess the efficacy of caregiver-assisted rehabilitation with strategy training (CAR-ST) in enhancing activity performance among stroke survivors.

**Methods:** A single-blinded, three-arm randomized controlled trial will compare CAR-ST, strategy training, and attentional control through education. Eligible stroke survivors and their caregivers will be recruited from hospitals in Northern Taiwan and randomly assigned to one of the three groups in a 1:1:1 ratio. Evaluations will take place at baseline, post-intervention, and at 3- and 6-month follow-ups, using the Activity Measure for Post-Acute Care (AM-PAC) as the primary outcome. Secondary outcomes will include the Participation Measure-3 Domains, 4 Dimensions (PM-3D4D), EuroQol-5D (EQ-5D), Stroke Self-Efficacy Questionnaires (SSEQ), Fugl-Meyer Assessment (FMA), and Montreal Cognitive Assessment (MoCA). Following modified intention-to-treat principle, data will be analyzed with repeated-measured ANCOVA. Post-intervention interviews will explore participant

experiences and satisfaction, analyzed through thematic analysis.

**Discussion:** This study endeavors to provide critical evidence on the immediate and long-term benefits of the CAR-ST program in reducing activity limitations for stroke survivors. The anticipated findings are expected to endorse the implementation of caregiver-assisted intervention in rehabilitation practice and inform future research development.

**Keywords :** Stroke, Caregiver-assisted rehabilitation, Strategy training, Activity limitation

**Corresponding author :** 張鳳航

**E-mail :** fhchang@tmu.edu.tw

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**Presentation No. :** E\_OTP010

**Submission No. :** 1130182

**Effect of Mirror Therapy Combined with Task- vs. Impairment-oriented Intervention in Patients with Stroke**

Sheng-shiung Chen <sup>1</sup> Keh-chung Lin <sup>2</sup> I-ping Yeh <sup>3</sup> Yi-chun Li <sup>4</sup>

<sup>1</sup> E-Da Hospital

<sup>2</sup> National Taiwan University

<sup>3</sup> Chang Gung Memorial Hospital, Taoyuan

<sup>4</sup> I-Shou University

**Background:** Mirror therapy (MT) has gained popularity in stroke rehabilitation and may be combined with interventions such as task- and impairment-oriented practice. MT combined with task- and impairment-oriented practice may yield differential benefits for recovery from stroke.

**Objectives:** This study examined the effects of MT combined with task- (MT-TOT) vs. impairment-oriented (MT-IOT) therapy, relative to TOT in combination with IOT (TOT-IOT) in patients with stroke.

**Methods:** This is a single-masked, pilot clinical trial. Sixteen participants with stroke were randomized into 1 of 3 groups, i.e., MT-TOT, MT-IOT, or TOT-IOT. Each intervention session was 90 minutes/day, three days/week, with a transfer package for home practice for five days/week. The outcome measures included the Fugl-Meyer Assessment – Upper Extremity (FMA-UE) and the Chedoke Arm and Hand Activity Inventory (CAHAI). Treatment outcomes were studied based on minimal clinically important difference (MCID) and minimal detectable change (MDC).

**Results:** All participants demonstrated improvement immediately after treatment. Most of the participants receiving MT-TOT achieved the threshold of MCID in the FMA-UE. Approximately fifty percent of the participants receiving the MT-TOT or MT-IOT achieved MDC in the CAHAI.

**Conclusions:** The preliminary findings suggest that MT-TOT and MT-IOT may improve motor impairments and bilateral upper-limb dysfunction. Further study with a larger sample is needed to study the differential benefits of these combinatory interventions.

**Keywords :** stroke, mirror therapy, task-oriented practice, impairment-oriented practice

**Corresponding author :** Yi-chun Li

**Presentation No. : E\_OT5005**

**Submission No. : 1130094**

**Comparative Effects of Somatosensory-Motor and Somatosensory-Oriented Training on Somatosensory Function in patients with chronic stroke: Protocol for an RCT**

Yee-Han Keng<sup>1</sup> Yi-Jing Huang<sup>1,2</sup> Huey-Wen Liang<sup>2</sup> Jiann-Shing Jeng<sup>3</sup>

I-Ping Hsueh<sup>2,4</sup>

1 School of Occupational Therapy, National Taiwan University

2 Department of Physical Medicine and Rehabilitation, National Taiwan University Hospital

3 Department of Neurology, National Taiwan University Hospital

4 School of Occupational Therapy, National Taiwan University

**Background:** Stroke is a leading cause of disability globally, about half of patients experiencing impaired somatosensory function, influencing their quality of life. Studies have shown that active sensory intervention strategies can enhance cortical reorganization and may help restore patients' somatosensory functions. In addition, given the constant two-way conversation between somatosensory and motor cortices, the intervention targeting sensorimotor integration may lead to better acquisition of motor skills. The somatosensory-motor training program emphasizes that patients receive different sensory stimulations while actively engaging in task-oriented tasks. However, limited research has explored the efficacy of somatosensory-motor training program on somatosensory function.

**Purposes:** This project aims to compare the effects of somatosensory-motor training and somatosensory-oriented training on somatosensory function in patients with chronic stroke.

**Methods:** This study will recruit 58 patients into a single-blind (evaluator-blind) randomized controlled trial. After receiving the pre-test assessment, the patients will be randomly assigned to the somatosensory-motor treatment group or the somatosensory-oriented training group according to stratified blocks. Patients will receive a total of 15 hours of treatment over five weeks (3-5 hours per week) and post-test assessments within one week after the completion of the treatment. The primary outcome will include somatosensory function, assessed by the Revised Nottingham Sensory Assessment and the Rivermead Assessment of Somatosensory Performance. The secondary outcome will include daily activity function and quality of life, assessed using the Barthel Index and the World Health Organization Quality of Life. Within each group, paired t-tests will be employed to analyze the effectiveness of training before and after intervention. The differences between the two groups will be compared using an independent t-test.

**Expected results and contributions:** We expect that the somatosensory-motor training will have a superior effect to the somatosensory-oriented training on the somatosensory function in patients with chronic stroke. The findings of this study will help therapists to choose treatment approaches for optimizing somatosensory recovery for patients with chronic stroke.

**Keywords :** stroke, somatosensory, somatosensory-motor training

**Corresponding author :** 耿逸涵

**E-mail :** athenakeng002@gmail.com

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**Presentation No. :** E\_OT006

**Submission No. :** 1130082

高齡駕駛在交通的視而不見現象：系統性回顧

**The looked-but-failed-to-see errors in older drivers: A systematic review**

Chin-Yu Chang<sup>1</sup> Yu-Ting Chen<sup>1</sup>

<sup>1</sup> 國立成功大學

**Introduction:** Looked-but-failed-to-see (LBFTS) in traffic scenarios occurs when a driver fails to detect a distinctly visible stimulus ahead. Crash database analysis showed that this error accounts for 69-80% of crashes at intersections. As a perceptual-cognitive error, older adults may be more likely to commit this error compared to middle-aged drivers due to normal functional decline or multiple medical conditions. Yet, no review studies have been done to examine whether aging is a factor of the LBFTS error. This systematic review study aims to synthesize findings to examine whether older drivers have a higher risk of making looked-but-failed-to-see (LBFTS) errors compared to younger drivers.

**Method:** The search was conducted in Web of Science, Scopus, Embase, MEDLINE (Ovid), and Cochrane CENTRAL trials. The inclusion criteria of the studies were: (1) studies comparing older (aged  $\geq$  65 years old) and younger drivers' LBFTS errors, (2) the LBFTS performance was presented by the detection rate of critical road objects or hazards, and (3) written in Chinese or English. Studies were excluded if (1) participants were diagnosed with degenerative disorders (e.g., dementia, Parkinson's disease), or (2) participants were required to engage in additional distracting tasks unrelated to driving. The final search was conducted on March 24, 2024. Data were extracted using a predetermined form to collect the features of study participants and instruments to test the LBFTS error. The main outcome was the detection rate of critical road objects or hazards in traffic scenarios. The risk of bias was evaluated using the JBI assessment tool. The article screening, data extraction, and quality assessment were conducted by two researchers. Any conflicts were discussed for consensus.

**Result:** Eight-eight articles were identified from the search. After screening and removing duplications, three articles met the selection criteria, including 60 older drivers and 50 younger drivers in total. The LBFTS performances were presented using the detection rates between pairs of original and edited static traffic scenarios. The detection rate of older drivers (mean= 44.5-57.4%) was lower than younger drivers (mean= 69.2-75.0%). These studies had high risk of selection and measurement bias with poor quality.

**Discussion:** The three included studies consistently presented that older drivers' critical traffic object detection rates were lower than younger drivers, indicating the LBFTS errors may be a contributing



factor to crashes involved in older adults. However, strong conclusions could not be made due to the low number of studies included and their poor quality. Future studies can be expanded to study the relationship between aging, perceptual-cognitive ability, and LBFTS errors in traffic, and further investigate the risk factor of crashes involving older drivers.

**Keywords :** Looked-but-failed-to-see, older driver, systematic review, change blindness

**Corresponding author :** 張晉毓

**E-mail :** t76111012@gs.ncku.edu.tw

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## **Mental Health**

**Presentation No. :** E\_OTP011

**Submission No. :** 1130046

不同工作訓練型態對慢性精神病人增強權能影響之初探

### **Preliminary Exploration of the Impact of Different Job Training Types on Empowerment of Patients with Chronic Mental Illness**

呂家誌<sup>1</sup> 李士捷<sup>2</sup>

<sup>1</sup> 衛生福利部基隆醫院

<sup>2</sup> 台大職能治療學系

**Objective:** Empowerment is a multifaceted process that involves enhancing personal, interpersonal, and political power. It enables individuals, families, and communities to improve their circumstances proactively. However, chronic mental illness patients often experience diminished self-empowerment due to symptoms and social stigma. This reduced sense of empowerment can lead to decreased motivation for daily activities and a perceived lack of control over their lives, impacting their overall quality of life. Existing research has highlighted the positive impact of work training on self-efficacy in chronic mental illness patients. However, few studies have compared different work involvement approaches in empowerment. This study aims to explore the relationship between various work training modalities and the empowerment of chronic mental illness patients.

**Methods:** The study employed a cross-sectional design, recruiting participants from a day-ward within a regional teaching hospital in northern Taiwan from April to June 2022. Participants were divided into three groups based on the services they received: (1) Ward Routine Services, (2) Ward Routine Services + Work Rehabilitation Training, and (3) Ward Routine Services + Sheltered Employment. The Empowerment Questionnaire assessed total empowerment scores and specific subscales, including self-efficacy, internal locus of control, external control, interpersonal communication skills, interpersonal self-assertion, and social self-assertion.

**Results:** 44 chronic mental illness patients completed the Empowerment Questionnaire significant differences were found among the three groups in terms of age, age of onset, diagnosis, gender, educational level, or religious belief ( $p > 0.060$ ). Significant differences were observed in the total score, self-efficacy, internal locus of control, and external control subscales ( $\eta^2 > 0.167$ ,  $p < 0.024$ ). Post-hoc comparisons revealed that the sheltered employment group had the highest total score

(96.6), followed by the work rehabilitation training group (90.3), and the day-ward routine services group (83.1). Only the sheltered employment group showed a statistically significant difference compared to the standard ward services group ( $p = 0.004$ ). Both the vocational rehabilitation training group and the sheltered employment group achieved identical scores in self-efficacy and internal locus of control (both 23.1), significantly surpassing the standard ward services group ( $p < 0.013$ ). The sheltered employment group scored significantly higher in the external control subscale compared to the other two groups ( $p = 0.043$ ), with no significant difference between the other two groups (both 13.6).

**Conclusion:** This study highlights a positive correlation between work training and empowerment in chronic mental illness patients. Both the work rehabilitation training group and the sheltered employment group demonstrated higher self-efficacy and internal locus of control scores. However, only the sheltered employment group showed higher external control scores. Future research with larger sample sizes is needed to validate these findings. Additionally, selecting optimal work training programs based on empowerment status can enhance outcomes in day-ward rehabilitation plans

**Keywords :** Empowerment, Work Training, Chronic mental illness

**Corresponding author :** 呂家誌

**E-mail :** psy00407@gmail.com

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**Presentation No. :** E\_OTP012

**Submission No. :** 1130047

運用情緒辨識策略及敘述性書寫對於慢性精神病人情緒調節效果之初探

### **A Preliminary Exploration of the Effects of Emotional Recognition Strategies and Narrative Writing on Emotion Regulation in Patients with Chronic Mental Illness**

呂家誌<sup>1</sup> 李士捷<sup>2</sup>

<sup>1</sup> 衛生福利部基隆醫院

<sup>2</sup> 國立台灣大學職能治療學系

**Objective:** Chronic mental illness patients frequently struggle with recognizing and regulating their emotions, often resulting in alexithymia and a predilection for negative emotion regulation strategies. These difficulties can lead to interpersonal conflicts and a diminished quality of life. While prior research indicates that observing and recording self-emotions can improve self-awareness and facilitate the selection of appropriate emotion regulation strategies, most evidence is derived from studies on healthy adults, leaving the specific effects on chronic mental illness patients unclear. This study aims to evaluate the impact of emotion recognition strategies and narrative writing on the emotional regulation of chronic mental illness patients.

**Methods:** The study recruited 54 chronic mental illness patients from the day ward of a regional teaching hospital in northern Taiwan. Participants were instructed to observe their facial expressions in the mirror weekly, document the life events that elicited these expressions along with their coping mechanisms, and discuss their observations with an occupational therapist every Monday. The study

was from January to July 2023. to examine the change of Alexithymia and emotional expression conflicts by the Toronto Alexithymia Scales and the Achievement Emotions Questionnaire, before and after the intervention.

**Results:** Participants' average age was 50 years old, with equal gender distribution. Nearly 90% were diagnosed with schizophrenia, and the average age of onset was 25 years old. The findings revealed a significant and moderate-to-large reduction in emotional expression conflicts following the intervention involving emotion recognition strategies and narrative writing ( partial  $\eta^2=0.085$ ,  $p=0.031$  ). However, there was no significant change in alexithymia ( partial  $\eta^2=0.005$ ,  $p=0.626$  ).

**Conclusion:** The results suggest that employing emotion recognition strategies and narrative writing may effectively reduce emotional expression conflicts in chronic mental illness patients, though it does not significantly affect alexithymia. Future research should incorporate more rigorous randomized controlled trials to validate the effectiveness of these methods in mitigating emotional expression conflicts, thereby providing a robust evidence base for their implementation in day wards to improve emotional regulation in chronic mental illness patients

**Keywords :** Chronic mental illness patients, emotional expression conflicts, narrative writing.

**Corresponding author :** 呂家誌

**E-mail :** psy00407@gmail.com

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**Presentation No. :** E\_OTP013

**Submission No. :** 1130109

阻力性訓練於思覺失調症之介入成效—文獻回顧

**The effects of resistance training in patients with schizophrenia: A literature review.**

古芳瑜<sup>1</sup> 王炫文<sup>1</sup>

<sup>1</sup> 臺北市立聯合醫院松德院區

**Background :** The patients with schizophrenia were affected by symptoms, resulting in apathy, decreased motivation, loose daily life, and lower activity levels. As age increases, muscle mass and strength will decline, and the risk of Sarcopenia is higher than normal. Walking, stair up-and-down, sit-to-stand, and balance will become difficult.

**Objective :** We aim to explore the effects of resistance training in patients with schizophrenia.

**Method :** The researchers conducted a literature search in the past 10 years (from 2012 to 2021) through PubMed in January 2022. The keywords “schizophrenia”, “resistance training”, and “strength training” were used. Fifty-nine studies were obtained, and Fifty-three non-randomized controlled trials were excluded. Finally, the abstract were screened and 4 of them were included.

**Results :** Resistance training can improve the positive symptoms and negative symptoms of the patients with schizophrenia, increase muscle strength performance, and improve mobility functions such as sit-to-stand. The results of quality of life are inconsistent.

**Discussion :** Although the resistance training used in the literature is different, the results show that it can effectively improve muscle strength, and thereby improve functional fitness performance and

symptoms of the clients with schizophrenia. In the experimental group, there was no specific mention of whether to add aerobic exercise, but previous studies showed that aerobic exercise does not affect the muscle strength.

**Conclusion :** Antipsychotics combined with resistance training are more effective for the patients with schizophrenia. There were some differences of resistance training, but the patients can be improved on muscle strength and endurance. Resistance training has significant effects on both psychological and physical intervention in schizophrenia. In the future, longer-term resistance training in improving quality of life can be explored.

**Keywords :** schizophrenia, strength, resistance training

**Corresponding author :** 古芳瑜

**E-mail :** fyg0623@gmail.com

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**Presentation No. :** E\_OTP014

**Submission No. :** 1130010

### **Exploring the Impact of Lifestyle Interventions on Individuals with Mental Illness**

Yu Shiuan Liaw<sup>1</sup>

<sup>1</sup>Taoyuan Psychiatric Center Ministry of Health and Welfare

**Objective:** Individuals with mental illness are at a heightened risk of lifestyle-related diseases such as cardiovascular disease, cancer, and diabetes, resulting in increased morbidity and mortality rates compared to the general population. Lifestyle factors, including physical activity and diet, may serve as protective factors against depressive symptoms. Encouraging lifestyle modifications could offer an effective approach to managing and treating depression in this population. This review aims to investigate the efficacy of lifestyle interventions for individuals with mental illness.

**Methods:** A systematic search was conducted on PubMed for articles published between January 2014 and March 2024. Only randomized controlled clinical trials were included, with search terms focused on "Lifestyle Intervention" or "Lifestyle Modification" in conjunction with "Mental Illness." Initially, 67 articles were retrieved. Following screening of titles, abstracts, and full texts, only three articles met the eligibility criteria for inclusion in the review, as they specifically investigated lifestyle interventions in individuals with mental illness.

**Results:** Three studies, all conducted by researchers from Spain, met the eligibility criteria. Participants included individuals with mental illness, including major depression, and those meeting metabolic syndrome criteria. Interventions varied, encompassing community-based nurse-led lifestyle-modification, lifestyle modification programs, and lifestyle change written recommendations. Assessment dimensions included physical health and psychosocial outcomes. One study reported significant improvements in physical health indicators, such as BMI and physical activity. Regarding psychosocial outcomes, two studies found enhancements in quality of life. However, two studies reported no significant difference in depression scores between intervention and control groups.

**Conclusions:** The findings suggest that lifestyle interventions hold promise for improving health outcomes among individuals with mental illness, particularly in enhancing physical health and quality of life. These interventions may aid in mitigating the high prevalence of lifestyle-related diseases and reducing associated morbidity and mortality rates. Further research is warranted to fully elucidate the long-term effects and optimal implementation strategies of lifestyle interventions in this population.

**Keywords :** lifestyle intervention, lifestyle modification, mental illness, depression, metabolic syndrome

**Corresponding author :** 廖于萱

**E-mail :** ann90050@hotmail.com

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**Presentation No. :** E\_OTP015

**Submission No. :** 1130012

### **Effectiveness of Interventions Targeting Walking Speed in Individuals with Schizophrenia: A Systematic Review**

廖于萱<sup>1</sup>

<sup>1</sup> 衛生福利部桃園療養院

**Objective:** Objective: Walking speed is an objective and effective measure used to assess an individual's walking ability and performance. Reduced physical activity among individuals with schizophrenia can result in impaired physical function, potentially affecting their walking speed and activities of daily living. Hence, walking speed plays a pivotal role in assessing physical function and rehabilitation progress in schizophrenia patients. This review seeks to assess the effectiveness of walking interventions for individuals diagnosed with schizophrenia.

**Methods:** A systematic search was conducted on PubMed for articles published up to April 2024. The search utilized the keywords (schizophrenia[tw]) AND (walking speed[tw] OR mobility[tw] OR gait[mh]). Articles of the type RCT or clinical trial were targeted. Initially, 12 articles were identified. Following the screening of titles, abstracts, and full texts, two articles met the eligibility criteria for inclusion in the review.

**Results:** Two studies conducted by researchers from Taiwan and the United States, respectively, met the eligibility criteria. Interventions varied, encompassing animal-assisted therapy (AAT) and a videogame-based physical activity program using the Kinect for Xbox 360 game system. Assessment dimensions included walking speed, with the first study also including communication and interaction skills. The first study reported significant improvements in lower extremity strength and social skills. The other study showed improvements in walking speed. However, neither of these two studies demonstrated significant improvements in walking speed between the intervention group and the control group.

**Conclusions:** While interventions targeting walking speed in individuals with schizophrenia, such as animal-assisted therapy and videogame-based physical activity programs, have shown promising

outcomes in terms of improving lower extremity strength, social skills, and walking speed, it's important to note that these improvements were not statistically significant when comparing the intervention and control groups. Despite these findings, the potential benefits of such interventions warrant further exploration through larger-scale studies with longer follow-up periods to better understand their impact on individuals with schizophrenia. Currently, there is limited research specifically targeting walking speed in individuals with schizophrenia, despite its association with functional impairments. Therefore, future studies could focus on interventions aimed at improving walking speed and assess whether enhancements in physical and functional abilities result from improvements in walking speed.

**Keywords :** schizophrenia, walking speed, mobility, gait, intervention

**Corresponding author :** 廖于萱

**E-mail :** ann90050@hotmail.com

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**Presentation No. :** E\_OTP016

**Submission No. :** 1130013

### **Frailty and Walking Speed Interventions in Mental Illness**

廖于萱<sup>1</sup>

<sup>1</sup> 衛生福利部桃園療養院

**Objective:** Walking speed serves as an objective and reliable metric for evaluating an individual's mobility and physical performance. Additionally, it is closely linked to frailty, reflecting the level of physical function and frailty severity. Individuals with mental illness often exhibit reduced walking speed and are prone to early onset of frailty. This review seeks to examine the effectiveness of interventions targeting frailty and walking speed among individuals with mental illness.

**Methods:** A systematic search was conducted on PubMed for articles published until April 2024. The keywords used were (frailty[tw] OR sarcopenia[tw]) AND (walking speed[tw] OR gait[mh]) AND (mental illness[mh] OR schizophrenia[tw]) NOT geriatric. Initially, 47 articles were retrieved. After screening titles, abstracts, and full texts, none of the articles met the eligibility criteria for inclusion in the review. Instead, only one article was selected to discuss the findings, with the aim of informing potential interventions for mental illness in the future.

**Results:** The only relevant article found in the systematic search, titled "Effects of High-Speed Power Training (HSPT) on Neuromuscular and Gait Functions in Frail Elderly with Mild Cognitive Impairment (MCI) Despite Blunted Executive Functions: A Randomized Controlled Trial," aimed to evaluate whether HSPT could enhance physical function despite the presence of blunted executive functions commonly observed in MCI. The results indicated that HSPT yielded positive effects on physical function.

**Conclusions:** Although the identified study focused on frail elderly individuals with MCI, its findings underscore the importance of investigating interventions targeting physical function in individuals with mental illness, particularly those vulnerable to frailty. Despite the study's focus on

older adults with MCI, its implications extend to other populations, including individuals with mental illnesses such as schizophrenia. Further research is warranted to explore the effectiveness of similar interventions tailored to individuals with mental illness in addressing challenges related to physical function and frailty in this population.

**Keywords :** mental illness, schizophrenia, frailty, walking speed

**Corresponding author :** 廖于萱

**E-mail :** ann90050@hotmail.com

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**Presentation No. :** E\_OTP017

**Submission No. :** 1130021

### **Impact of Walking Activity on Walking Speed and Frailty Among Individuals with Mental Illness: A One-Year Follow-Up Study**

廖于萱<sup>1</sup> 李杰騰<sup>1</sup>

<sup>1</sup>衛生福利部桃園療養院

**Objective:** Walking speed is a crucial indicator of frailty, especially among individuals with mental illness who often experience reduced mobility and are prone to early frailty. This study aims to assess the impact of a 20-minute weekly walking activity on walking speed among individuals with mental illness over the course of one year. Additionally, the study aims to explore potential interventions to enhance walking speed and overall mobility in this population.

**Methods:** Participants were recruited from a psychiatric hospital in northern Taiwan. The intervention involved participating in a 20-minute walking activity once a week for one year. Participants attending the sessions at least 50% of the time were assigned to the walking group (G1), while the remaining participants were designated as the control group (G0). Walking speed was assessed using the Time Up and Go test (TUG) at the pre-test (T0) and one year later at the post-test (T1). Generalized estimating equation (GEE) analyses were conducted to evaluate the intervention effects.

**Results:** A total of 34 male patients (G1: n=28; G0: n=6) with an average age of 51.41±9.29 years were included in the analysis. The majority (94.1%) had a diagnosis of schizophrenia, and 47.1% had completed high school. At T0, the TUG score was 7.49±0.86 in G1 and 5.98±0.15 in G0. At T1, the scores were 9.34±1.28 in G1 and 7.39±0.48 in G0. No participants in G0 were frail at either T0 or T1. In G1, 5 participants were frail at T0, and the same number remained frail at T1. However, there was no significant difference in the TUG score between G1 and G0 at T1, indicating no significant effectiveness of the walking activity intervention.

**Conclusions:** Despite our efforts to investigate the impact of walking activity on walking speed among individuals with mental illness over a one-year period, our findings did not reveal a significant difference in walking speed between G1 and G0. Possible reasons for this lack of significant improvement may include low intervention duration and frequency, a small number of participants recruited, and other potential factors not considered in the analysis. However, the

number of frail participants did not increase compared to one year ago, suggesting that walking activity may help mitigate the progression of frailty. Future studies could consider larger sample sizes and longer intervention durations to provide more robust evidence regarding the effectiveness of interventions aimed at improving mobility in individuals with mental illness.

**Keywords :** mental illness, schizophrenia, walking speed, frailty, one-year follow-up

**Corresponding author :** 廖于萱

**E-mail :** ann90050@hotmail.com

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**Presentation No. :** E\_OTP018

**Submission No. :** 1130111

### **The Impact of Resistance Exercise on Mental Illness: A Systematic Review of Recent Randomized Controlled Trials**

廖于萱<sup>1</sup>

<sup>1</sup>衛生福利部桃園療養院

**Objective:** Individuals with mental illness are often significantly impacted by their condition, affecting their participation in daily activities, leisure pursuits, and work, which makes independent living in the community challenging. Exercise is a commonly used clinical intervention, and many studies have documented its positive effects on individuals with mental illness. However, there is limited literature on the efficacy of resistance exercise for this population. Therefore, this study aims to investigate the effects of resistance exercise on individuals with mental illness.

**Methods:** A systematic search was performed on PubMed for articles published within the past decade, up to July 2024. The search terms used were (schizophrenia[mh] OR mental illness[mh]) AND (elastic band[tw] OR resistance band[tw] OR resistance exercise[tw]). The focus was on identifying RCTs and clinical trials. The initial search yielded 51 articles. After screening the titles, abstracts, and full texts, six articles were deemed eligible for inclusion in the review.

**Results:** Six studies were conducted by researchers from different countries, including Taiwan, the United States, Turkey, and other countries. The participants had various diagnoses: two studies focused on schizophrenia, two on Generalized Anxiety Disorder (AGAD), and the others on PTSD and dementia. The interventions varied, encompassing resistance band exercises, equipment-based resistance exercises, resistance exercise movements, and ball exercises. The intervention frequency was 2-3 times a week, lasting 25-60 minutes. All studies assessed symptoms related to the participants' diagnoses. Additional assessment dimensions included behavioral problems, functioning, and quality of life. All studies found that resistance exercise improved symptoms of mental illness. Specifically, resistance exercise decreased behavioral problems in dementia, improved social and occupational functioning in schizophrenia, and enhanced muscle strength and quality of life in schizophrenia.

**Conclusions:** The findings of this review suggest that resistance exercise has beneficial effects on individuals with mental illness. It can reduce behavioral problems, improve social and occupational



functioning, and enhance muscle strength and quality of life. These positive outcomes indicate that resistance exercise is an effective intervention for improving various aspects of health and well-being in this population. Given the limited literature on this topic, further research is needed to strengthen the evidence base and explore the long-term benefits of resistance exercise for individuals with different types of mental illness.

**Keywords :** resistance exercise, elastic band, mental illness, schizophrenia, clinical intervention

**Corresponding author :** 廖于莹

**E-mail :** ann90050@hotmail.com

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**Presentation No. :** E\_OTP019

**Submission No. :** 1130144

**Music rhythm reduced movement abnormalities in people with psychotic experiences: A randomized controlled trial**

Shu-Mei Wang <sup>1</sup> Ho-Yan Chan <sup>2</sup> Chung-Yan Chan <sup>2</sup> Lok-Yi Fong <sup>2</sup>

1 Department of Long-Term Care, National Taipei University of Nursing and Health Sciences

2 Department of Rehabilitation Sciences, The Hong Kong Polytechnic University

**Background:** People with psychotic experiences (PE) exhibit slow movements and uncontrolled/involuntary movements, which cause negative consequences on people's work/school performances and social expressive behaviors. Additionally, movement abnormalities are associated with subsequent increased risk of the onset of psychotic diseases. Only few studies have developed early intervention for these initial abnormalities in the psychosis continuum.

**Aims:** This pilot randomized controlled trial was to examine if the use of classical music rhythm (MR), an attractive and promising technique of neurologic music therapy, incorporated in functional movement training reduced severity of slow movements and uncontrolled movements in people with PE.

**Methods:** Fifteen people with PE were randomly allocated to receive 21-day and daily 40-minute functional movement training (picking up beads) with the aid of MR or to receive the same training without the aid of MR. This study adopted motion analysis to measure severity of movement abnormalities at pretest and posttest. This study also recruited 15 age- and gender-matched people without PE to provide reference data of movement performances.

**Results:** MR incorporated in dominant-hand movement training may reduce severity of slow movements and uncontrolled movements at both hands in people with PE.

**Conclusions:** Rich neural connections between auditory and motor cortices in humans may explain powerful influences of MR on movements in people with PE, who have basal ganglia alterations and thus possibly affected motor control. This study offers initial evidence of efficacy of music-related non-pharmacological early intervention that tackles initial abnormalities in the psychosis course.

**Keywords :** Early intervention; motor skills; music; psychosis; psychotic-like experience

**Corresponding author :** Shu-Mei Wang

E-mail : dr.smwang@gmail.com

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**Presentation No. : E\_OTP020**

**Submission No. : 1130154**

**Effects of Resistance Exercise on Frailty in Individuals with Schizophrenia: A Randomized Controlled Trial**

廖于萱<sup>1</sup>

<sup>1</sup>衛生福利部桃園療養院

**Objective:** Clinically, individuals with schizophrenia often exhibit low motivation, reduced physical activity, decreased muscle strength, and frequent falls, which may be related to frailty. Previous research has indicated that resistance exercise can enhance muscle strength, improve occupational functioning, and increase the quality of life in patients with schizophrenia. However, there is limited literature on the efficacy of resistance exercise for this population concerning frailty. Therefore, this study aims to investigate the effects of resistance exercise on frailty in individuals with schizophrenia.

**Methods:** Sixty participants with schizophrenia will be recruited from the rehabilitation ward at Taoyuan Psychiatric Center, Ministry of Health and Welfare in Taiwan. The participants will be randomly assigned to either the resistance exercise program (REP) group or the treatment as usual (TAU) group. The REP will consist of 30-minute sessions, held twice a week for three months. Each session will include warm-up exercises (5 minutes), resistance band exercises (20 minutes), and stretching exercises (5 minutes). According to Fried frailty indicators, the following five components will be measured: slow walking speed (measured by the Timed Up and Go test, TUG), low handgrip strength (men:  $\leq 26$  kg, women:  $\leq 18$  kg), weight loss ( $\geq 3$  kg in the preceding year), low physical activity, and depression (measured by the Center for Epidemiologic Studies Depression Scale, C-ESD). Participants will be classified as frail if they have three or more positive indicators, pre-frail with one or two indicators, and non-frail with no positive indicators. Self-reported outcome measures, including the Brief Psychiatric Symptom Rating Scale (BSRS) and the Schizophrenia Quality of Life Scale Revision 4 (SQLS-R4), will be assessed. Measurements will be conducted at three time points: pre-test, post-test, and one-month follow-up. Generalized estimating equation (GEE) will be used to examine the effects of the resistance exercise program on frailty, psychiatric symptoms, and quality of life.

**Expected Results:** Individuals with schizophrenia who participate in the REP group are expected to show significant improvement in frailty, psychiatric symptoms, and quality of life compared with the control group. The REP is anticipated to reduce health decline, promote well-being, and be a feasible addition to rehabilitation programs for people with schizophrenia. Based on the expected results of this study, it is recommended to incorporate and promote sustained resistance exercise within rehabilitation programs for individuals with schizophrenia.

**Keywords :** schizophrenia, frailty, resistance exercise, psychiatric symptoms, quality of life

**Corresponding author : 廖于莹**  
**E-mail : ann90050@hotmail.com**

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**Presentation No. : E\_OTP021**

**Submission No. : 1130167**

**Exploring the Relationship Between Burnout and Stigma in Psychiatric Occupational Therapy Practitioners in Taiwan**

Pei-Zhen Wu <sup>1</sup> Hui-Ing Ma <sup>2</sup>

<sup>1</sup> Department of Occupational Therapy, Jianan Psychiatric Center, Ministry of Health and Welfare, Tainan, Taiwan

<sup>2</sup> Department of Occupational Therapy, National Cheng Kung University, Tainan, Taiwan

**INTRODUCTION :** Mental health professionals strive to eliminate stigma associated with mental illness. However, research has indicated that these professionals may themselves hold stigmatizing attitudes. One manifestation of this stigma is maintaining social distance from individuals with mental illness. Unawareness of their own stigmatizing behaviors could undermine treatment outcomes. Research from other countries suggests that burnout may be a significant factor contributing to the stigma mental health professionals hold towards mental illness. In Taiwan, psychiatric occupational therapy(OT) practitioners are dedicated to enhancing the health and well-being of individuals with mental illness. Despite their commitment, these practitioners are currently experiencing severe burnout. There is a lack of research exploring the relationship between burnout and stigma towards mental illness among psychiatric OT practitioners in Taiwan. This study aimed to investigate the relationship between burnout and the preferred social distance toward mental illness among psychiatric OT practitioners in Taiwan.

**METHODS :** This cross-sectional study recruited licensed OT practitioners working in psychiatric settings through regional OT unions. Data were collected using online questionnaires, which included questions on demographics, the Oldenburg Burnout Inventory(OLBI) and the Social Distance Scale(SDS). The OLBI consists of two subscales: Exhaustion (i.e., exhaustion resulting from work) and Disengagement(i.e., emotional distancing from one's work), with higher scores indicating greater burnout. The SDS assessed stigmatization by gauging participants' willingness to engage in social interactions with individuals with mental illness, with higher scores indicating a greater preference for social distance. Pearson correlation tests were utilized to analyze the data.

**RESULTS :** A total of 124 psychiatric OT practitioners completed the questionnaire. The results indicated that the demographic characteristics(e.g., ages, years of experience) of psychiatric OT practitioners was not significantly correlated with social distance. However, higher level of burnout was associated with greater preference for social distance. Disengagement and exhaustion were weakly but significantly correlated with social distance (Disengagement:  $r = .218$ ;  $p = .015$ ; Exhaustion:  $r = .191$ ;  $p = .033$ ).

**CONCLUSION :** The results suggest that psychiatric OT practitioners who experience greater

emotional distancing and exhaustion resulting from their works would have lower willingness to interact with people with mental illness. The results highlight the importance of managing burnout and mitigating stigmatizing behaviors.

**Keywords :** burnout, stigma, psychiatric occupational therapy practitioners, mental illness

**Corresponding author :** 吳培甄

**E-mail :** temtemi0801@gmail.com

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**Presentation No. :** E\_OTP022

**Submission No. :** 1130038

### **Enhancing Recovery: A Journey in Psychiatric Hospital Care**

Zhao Zhenru<sup>1</sup> Clare Ang Kai Yee<sup>1</sup> Mavis Chia Xian Shu<sup>1</sup> Nawira Baig Bte Israr Baig<sup>1</sup> Alex Su Hsin Chuan<sup>1</sup>

<sup>1</sup> Institute of Mental Health

**Introduction:** In the dynamic landscape of psychiatric care, the journey towards recovery-focused models represents a significant paradigm shift. This abstract chronicles the transformative initiative undertaken at a psychiatric hospital in Singapore from September 2020 to November 2023, aimed at infusing recovery-focused care into acute ward settings.

**Building Awareness and Knowledge:** Central to our initiative was the development of comprehensive training courses. These courses were designed to impart essential knowledge and foster awareness among healthcare staff. By equipping them with the tools to understand and implement recovery-focused approaches, we aimed to cultivate a culture of empowerment and collaboration.

**Empowering Service Users:** Empowerment lies at the heart of recovery. We devised recovery booklets, empowering service users to take charge of their own journey towards wellness. These booklets served as invaluable resources, providing guidance and support as individuals navigated the complexities of their mental health challenges.

**Piloting Recovery-Focused Wards:** Two pilot wards emerged as the focal point of our endeavour. Here, staff underwent specialized training, embracing the principles of recovery-focused care under the guidance of occupational therapists (OTs). Through dedicated efforts and a commitment to holistic wellbeing, these wards became beacons of innovation and progress within the psychiatric hospital. Recognizing the diverse needs of service users, we adopted a multifaceted approach to group sessions. OTs, together with doctors, peer support specialist, and nurses, implemented programmes to initiate the recovery journey.

**Structured and Unstructured Group Sessions:** Group sessions were conducted to empower service users to gain confidence and skills (e.g. Instrumental activities of daily living skills, social skills) to work towards their goals. Furthermore, group sessions allow them to build routine and give them the autonomy to choose their preferred leisure activities. For instance, service users were involved in planning and preparing events like ‘carnival day’ where they made movie tickets and

prepared snacks. Unstructured leisure sessions were conducted weekly. Service users can choose activities like craft, games and puzzles, from the resource trolley.

**Impact and Challenges:** The impact of our initiative reverberated throughout the psychiatric hospital. Increased awareness of recovery care and mental health rehabilitation was evident, with positive feedback from service users underscoring the effectiveness of our approach. Moreover, referrals to psychiatric rehabilitation wards surged in the pilot wards, signalling a tangible shift towards holistic, recovery-focused care.

However, our journey was not without its challenges. Schedule conflicts and manpower issues posed logistical hurdles, while resistance among staff towards the recovery care model necessitated ongoing education and support. Yet, these challenges served as catalysts for growth, galvanizing our resolve to overcome obstacles and forge ahead on the path towards enhanced psychiatric care.

**Conclusion:** In retrospect, our initiative stands as a testament to the transformative power of recovery-focused care. Through strategic training, empowerment, and the cultivation of innovative practices, we have ushered in a new era of psychiatric care characterized by instilling hope, compassion, collaboration and building resilience. As we continue to navigate the complexities of mental health, let us remain steadfast in our commitment to fostering recovery, one step at a time.

**Keywords :** Rehabilitation, mental health, recovery program, psychiatric hospital

**Corresponding author :** Zhao Zhenru

**E-mail :** zhenru\_zhao@imh.com.sg

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**Presentation No. :** E\_OTP023

**Submission No. :** 1130061

正向思考訓練對住院慢性精神病患者心理健康的成效

**The Effectiveness of Positive Thinking Training on the Mental Health of Hospitalized Chronic Psychiatric Patients**

黃文儀<sup>1</sup> 鄭長欣<sup>1</sup> 蕭涵憶<sup>1</sup>

<sup>1</sup>衛生福利部嘉南療養院

**Purpose:** Chronic psychiatric patients often experience negative emotions, exacerbating their mental health issues, especially after stress-inducing situations such as pandemic isolation. This study aims to investigate the impact of positive thinking training on the mental health of chronic psychiatric patients, focusing on their well-being, self-esteem, and self-efficacy.

**Method:** From June to September 2022, a convenience sampling method was used to recruit hospitalized chronic psychiatric patients for participation. A total of 26 subjects completed the study, with an average age of 51 years; 76.92% were diagnosed with schizophrenia, and 61.53% were male. Each subject participated in 12 sessions, attending at least 10 sessions. Each session lasted 60 minutes. For the first 5 minutes, participants meditated, focusing on their breath or listening to music to achieve inner calm. This was followed by 25 minutes of reading positive encouraging words, with four A4-sized pages containing about 20 positive thinking sentences each, and sharing these

thoughts. Next, participants engaged in 25 minutes of writing positive thoughts, ending with a 5-minute sharing session of the most resonant positive thoughts. Each session included 20 positive statements selected by the therapist from Jing Si Aphorisms or online platforms to foster positive thinking. Well-being, self-efficacy, and self-esteem were assessed using the WHO-5 Well-Being Index, GSES scale, and RSE scale, respectively. Statistical analysis was conducted using paired sample t-tests.

**Results:** The study found that after 12 weeks of positive thinking training, there was no significant improvement in the well-being ( $p=0.119$ ), self-esteem ( $p=0.218$ ), and self-efficacy ( $p=0.662$ ) of chronic psychiatric patients.

**Conclusion:** Although the study did not show significant improvements in the mental health of chronic psychiatric patients through positive thinking training, participants expressed high satisfaction with the activities, noting a relaxation and uplift in their mood. This suggests that positive thinking training may impact patients' emotions and self-perception. Future research should employ more comprehensive assessment tools to evaluate the effects of positive thinking training on mental health. Encouraging patients to cultivate a positive mindset and self-affirmation could help them better cope with life's challenges and stress, enhancing their psychological resilience and self-regulation abilities.

**Keywords :** Positive thinking training, chronic psychiatric patients, mental health, well-being, self-esteem, self-efficacy, psychological resilience

**Corresponding author :** 黃文儀

**E-mail :** wenyi1836@yahoo.com.tw

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**Presentation No. :** E\_OTP024

**Submission No. :** 1130087

園藝團體應用於慢性精神疾患個案之療效初探

**The Effects of Horticultural Activities on Patients with Chronic Mental Disorders: A Pilot Study in Northern Taiwan**

劉宜佳<sup>1</sup> 戴鳳琳<sup>1</sup>

<sup>1</sup> 衛生福利部臺北醫院

<sup>2</sup> 亞東紀念醫院

**Background and Objectives:** The belief in the healing power of plants is commonly held, attributed not only to their vigorous vitality, but also to the rich sensory stimulation provided by their diverse colors, forms, and fragrances. Horticultural therapy activities involve the use of plants and gardening activities. They serve as a medium to facilitate physical, mental, and emotional well-being through interactions between individuals and plants. This study aimed to explore the effects of a series of horticultural activities applied to individuals with chronic mental disorders.

**Methods:** Participants were recruited from a psychiatric day care unit in a hospital in northern Taiwan. Occupational therapists designed and led a five-week series of horticultural group activities.

The series included: Week 1: Introduction to plant classification and basic plant care; Week 2: Succulent plant arrangement and potting; Week 3: Plant Hunt Game; Week 4: Gardening from Seeds; Week 5: Making Seed Art. The Horticultural Therapy Well-being Questionnaire and Group Satisfaction Questionnaire were used to assess the effectiveness of the group. The Horticultural Therapy Well-being Questionnaire, administered before and after the series, consisted of seven dimensions: physical health, leisure activities, sense of achievement, mood status, cognitive function, social skills, and horticultural cultivation skills, each rated on a scale from 1 to 5. The Group Satisfaction Questionnaire evaluated participants' satisfaction with the group activities on a scale from 1 to 4, and open-ended questions were used to collect subjective feedback. Statistical analysis involved paired sample t-tests to analyze differences in scores on the "Horticultural Therapy Well-being Questionnaire" before and after the group sessions, and descriptive statistics and qualitative data were used to present the results of the "Group Satisfaction Questionnaire."

**Results:** A total of 59 participants took part in the horticultural activities. In the Horticultural Therapy Well-being Questionnaire, there was a significant increase in the "mood status" dimension score from 3.03 ( $\pm 0.93$ ) to 3.32 ( $\pm 0.89$ ),  $p = 0.031$ , and in the "understanding of horticultural cultivation techniques" dimension score from 2.17 ( $\pm 0.97$ ) to 2.81 ( $\pm 0.89$ ),  $p < 0.001$ . However, there were no significant differences in the scores of other dimensions between pre-test and post-test. The average satisfaction score on the Group Satisfaction Questionnaire was 3.05/4 ( $\pm 0.68$ ). Qualitative feedback from participants included comments on the lively and enjoyable activities, sense of achievement, and learning about the knowledge of caring plants.

**Conclusion and Discussion:** This study demonstrates the positive effects of horticultural activities on participants, particularly in terms of mood status and horticultural cultivation skills. Although other dimensions did not show significant improvements, this may be attributed to the relatively short duration of the group sessions. Most participants expressed satisfaction with the group activities, highlighting the relaxed atmosphere and sense of achievement, and expressed a desire to participate in similar themed groups in the future. Future research could explore extending the duration of group sessions, incorporating standardized assessment measures, and conducting multi-center studies in different hospitals and rehabilitation facilities to further validate the therapeutic effects.

**Keywords :** Horticultural therapy, Chronic mental disorders, Psychiatric day care, Well-being, Group therapy

**Corresponding author :** 劉宜佳

**E-mail :** breeze040612@gmail.com

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**Presentation No. :** E\_OTP025

**Submission No. :** 1130145

**Relationships between sensory processing patterns and sleep quality in individuals with mental illness in Taiwan**

Ting Kao<sup>1</sup> Megan Chang<sup>2</sup> Chou-Fang Lee<sup>1</sup>

<sup>1</sup>Department of Occupational Therapy, Jianan Psychiatric Center, Ministry of Health and Welfare

<sup>2</sup> Department of Occupational Therapy, San Jose State University

**Introduction:** Previous studies have shown the relationships between sensory processing patterns and sleep quality among other populations, such as college students, and individuals with Autism (Lane et al., 2022; Chang et al., 2019). However, less is known about the exhibit of sensory processing patterns in individuals diagnosed with mental health diagnoses as well as its relationship with sleep quality. Yet, it is apparent that sensory processing patterns may be a factor contributing to poor sleep, which could negatively impact health conditions and increase the risk for heart disease, stroke, and diabetes (Akinseye et al., 2016; Altman et al., 2012). Thus, the purpose of the study was to examine the associations between sleep issues and sensory processing patterns in individuals diagnosed with psychiatric disorders.

**Methods:** A cross-sectional survey study was used. Eligible adults who received a diagnosis from the psychiatrist and aged 18-64 from the rehabilitation wards, day wards, halfway house, and outpatient department at a psychiatric center in southern Taiwan were recruited. They must be able to read the questionnaire in traditional Chinese independently and/or completed elementary school. The survey includes 1) demographic questions, 2) the Adult Sensory Processing Measure-Taiwanese version (ASPS-TW); and 3) the Pittsburgh Sleep Quality Index - Chinese version (CPSQI).

**Results:** Out of 274 eligible participants recruited, 203 completed the survey with a 74% response rate. Most were males (66.7%), and the average age was  $48.4 \pm 9.13$  years, showing no significant differences in age between genders. The average sleep hour was  $8.0 \pm 1.4$  hours, and the average sleep efficiency reached 92% (67 - 100%). However, more than 77% had CPSQI global scores above 5, indicating significant sleep disturbances that may require further thorough sleep evaluation. The CPSQI sleep global score is significantly correlated with the majority of the sensory processing factors, including over-responsive to auditory, visual, and touch (all  $p < .01$ ) as well as overall under-responsiveness, auditory seeking, under-responsive to touch (all  $p < .05$ ). It is worth noting that of those who were hospitalized, all of them had sleep schedule regulated by the ward nurses requiring them to get up between 6-7 AM and lights out at 9-10 PM. They had at least four other roommates.

**Discussion:** Results suggest that sensory processing patterns and preferences should be considered when developing an individualized sleep treatment plan, as sensory processing patterns are significantly correlated with global sleep scores and some sleep components. Sleep is complex, and it remains unclear whether their sleep impacts daily routines as most of them have their daily occupations scheduled per hospital schedule. Also, it is unknown whether their home sleep environment (roommates, lighting, etc) differs from the hospital environment. Hence, it is important to form a team approach (e.g., psychiatrists, nurses, and occupational therapists) for better sleep results and provide home evaluation upon discharge. For occupational therapists, it is recommended to consider sensory processing preferences when addressing sleep in the evaluation and treatment plans.



**Keywords : sleep quality, sensory processing patterns, mental illness**

**Corresponding author : Kao, Ting**

**E-mail : kaoting1218@gmail.com**

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**Presentation No. : E\_OT007**

**Submission No. : 1130051**

**Validation and exploring the relationship between internet-related instruments among Ghanaian university students**

Yu-Ting Huang <sup>1</sup> Daniel Kwasi Ahorsu <sup>2</sup> Chung-Ying Lin <sup>3</sup>

<sup>1</sup> Institute of Allied Health Science, National Cheng Kung University

<sup>2</sup> Department of Special Education and Counselling, The Education University of Hong Kong

<sup>3</sup> Institute of Allied Health Science, National Cheng Kung University

The present study evaluated the psychometric properties of six instruments for assessing internet use-related disorders: the Gaming Disorder Test (GDT), Gaming Disorder Scale for Adolescents (GADIS-A), Bergen Social Media Addiction Scale (BSMAS), Smartphone Application-Based Addiction Scale (SABAS), Internet Gaming Disorder Scale-Short Form (IGDS9-SF), and Nomophobia Questionnaire (NMP-Q), along with their association with time spent on internet-related activities and psychological distress. The study recruited 520 university students (59.2% females, mean age 19.55 years) through purposive sampling. Cronbach's alpha and McDonald's omega were utilized to test the internal consistency of the instruments. Confirmatory factor analysis (CFA) was conducted with fit indices including comparative fit index (CFI) and Tucker-Lewis index (TLI) to examine construct validity, while Pearson correlation was employed to evaluate the relationship between the instruments. The results indicated satisfactory levels of internal consistency as shown by Cronbach's alpha (0.81-0.97) and McDonald's omega (0.81-0.97). The unidimensional structure was confirmed for GDT (CFI = 1.000; TLI = 0.999), BSMAS (CFI = 1.000; TLI = 0.999), SABAS (CFI = 0.998; TLI = 0.997), and IGDS9-SF (CFI = 0.999; TLI = 0.998); a two-factor structure was confirmed for GADIS-A (CFI = 0.998; TLI = 0.997); and a four-factor structure was confirmed for NMP-Q (CFI = 0.998; TLI = 0.998). Scores from instruments measuring gaming disorders, smartphone addiction, social media addiction, and nomophobia are all closely related ( $r = 0.10-0.96$ ;  $p < 0.009$ ). The study's findings demonstrate that the six instruments are reliable and valid for assessing internet-use disorders among university students in Ghana, and they indicate a link between all the instruments, indicating a strong relationship between these different forms of internet-related disorders.

**Keywords : internet addiction, problematic internet use, social media, internet use disorder, factor analysis, psychometric validation**

**Corresponding author : 黃鈺婷**

**E-mail : tnyuting@gmail.com**

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## Geriatric Care

Presentation No. : E\_OTP026

Submission No. : 1130041

### Factors Influencing Caregiver Burden in Long-Term Care 2.0: Insights from the Long-Term Care Case-Mix System

Ya-Chen Lee<sup>1</sup> En-Chi Chiu<sup>2</sup>

<sup>1</sup>Department of Occupational Therapy, College of Medical and Health Science, Asia University

<sup>2</sup>Department of Long-Term Care, National Taipei University of Nursing and Health Sciences

**Background:** As the global demographic shifts towards an older population, the demand for elderly care services has intensified, leading to increased pressure on primary family caregivers.

Understanding the dynamics of the caregiving environment is essential for alleviating caregiver burden and enhancing their support mechanisms. This study investigated the determinants of caregiver burden within the framework of Long-Term Care 2.0, using data from the Long-Term Care Case-Mix System (LTC-CMS).

**Methods:** This study utilized secondary data from the “Care Service Management Information Platform,” focusing on caregivers of recipients aged 65 and older who have a designated primary caregiver. The analysis explored how care recipients' self-care capabilities, demographic factors, and the caregivers' living conditions and support networks affect caregiver burden. Hierarchical linear regression models assessed the effects of Activities of Daily Living (ADLs), Instrumental Activities of Daily Living (IADLs), and various caregiver-related environmental and support variables.

**Results:** We analyzed 1,059 records corresponding to 653 care recipients. Controlled for sex, age, educational level, and marital status, key factors influencing caregiver burden included IADLs, the ability of care recipients to stay home alone for 1-3 hours, having more than one caregiver, health status over the past month, and overall quality of life. The results suggest that higher IADL scores and the ability of care recipients to stay home alone for short periods significantly reduce caregiver stress. Conversely, increased caregiving demands, worsening health of caregivers, and declines in their overall quality of life notably increase caregiver burden.

**Conclusion:** The study highlights that caregiver burden is lessened when care recipients can independently perform more complex activities. Regular, stable intervals between care evaluations also correlate with reduced caregiver burden. These insights underscore the importance of supporting caregivers through improved care recipient independence and structured support systems.

**Keywords :** Long-Term Care 2.0, caregiver burden, home-based services

**Corresponding author :** 邱恩琦

**E-mail :** enchichiu@ntunhs.edu.tw

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## Gerontechnology

Presentation No. : E\_OTP027

Submission No. : 1130193

銀髮健身俱樂部第二年計畫於中部某精神專科醫院執行評價分析

## Evaluation and Analysis of the Second Year Program of the Silver Fitness Club at a Psychiatric Hospital in Central Taiwan

許浣淇<sup>1</sup> 郭芳君<sup>2</sup> 鄭宇劭<sup>3</sup> 黃品瑀<sup>1</sup> 黃怡軒<sup>1</sup>

<sup>1</sup> 衛生福利部草屯療養院

<sup>2</sup> 澳門明愛恩暉長者綜合服務中心

<sup>3</sup> 練健康健身房

**Objective :** In response to the rapid aging of the population, the Ministry of Health and Welfare launched the Silver Fitness Club program in 2020. A psychiatric hospital in central Taiwan began implementing this project in 2022, focusing on serving patients with mental illness, elderly individuals, and their caregivers. The primary objective is to promote self-health, reduce frailty, and incorporate healthy lifestyle concepts to enhance physical and mental well-being while encouraging social participation.

**Method :** A silver fitness club was established at a psychiatric hospital in central Taiwan. To effectively delay and improve frailty, the program primarily focuses on resistance strength training and precise monitoring of exercise intensity. Equipment for group exercise heart rate monitoring, resistance training, and air bikes for cardio endurance training was set up. The primary beneficiaries are patients with mental disorders at the hospital. In addition to utilizing the designated space, instructors also bring exercise equipment to various units for group physical training. The main goal is to provide fitness services that improve strength and muscular endurance, along with a series of training courses for staff on leading exercises for special populations.

**Results :** Since the program's inception, the number of elderly users (aged 65 and above) has grown significantly, with 105 participants in 2022 and a cumulative total of 1,440 to date. An analysis of participants from August 2022 to September 2023 reveals noteworthy improvements in functional fitness performance. Except for static balance, all other assessed parameters showed over 50% improvement. Additionally, the muscle mass index of participants improved and was maintained at a rate of 57%. Notably, six individuals achieved muscle mass indices indicative of reversing sarcopenia.

**Conclusion :** The Silver Fitness Club Project exemplifies an innovative approach to elderly health promotion within a psychiatric setting. By leveraging the unique characteristics of the hospital environment, this initiative not only enhances the physical well-being of its participants but also fosters social engagement and improves overall quality of life. Future research should focus on expanding this model to further enhance its impact on vulnerable populations.

**Keywords :** Senior Fitness Club, mentally ill patients, physical fitness activities

**Corresponding author :** 許浣淇

**E-mail :** down330@hotmail.com

**Presentation No. : E\_OTP028**

**Submission No. : 1130126**

**The Phenomenon of Repeated Participation in Vocational Training among Individuals with Mental Disorders**

Wan-Ju Huang<sup>1</sup> Ying-Chun Chien<sup>1</sup>

<sup>1</sup> JIANAN PSYCHIATRIC CENTER, MOHW

**Objective:** To investigate the phenomenon, reasons, and employment outcomes of repeated participation in vocational training programs among individuals with mental disorders.

**Methods:** This retrospective study analyzed the case data of individuals with mental disorders who participated in vocational training programs at a psychiatric hospital over the past 20 years. The study aimed to understand the background information of the participants, the time interval between training sessions, employment status, and the differences between the first and second training sessions.

**Results:** Out of 240 participants in vocational training programs over 20 years, 7 (2.9%) participated in the training programs multiple times. The average age of these 7 participants was  $34.4 \pm 5.4$  years old (range: 29-44 years old) at the time of their first participation and  $42.0 \pm 5.6$  years old (range: 34-50 years old) at the time of their second participation. The average time interval between the two training sessions was 7.6 years (range: 4-11 years). A paired t-test revealed a statistically significant difference in the average age between the first and second participation ( $t = -7.257, p = 0.000$ ). The severity of the participants' disabilities was mainly mild to moderate, with only one participant experiencing an increase in the severity of their disability (from mild to moderate) during the second training session. Among the 7 participants, 4 chose different vocations to learn new skills in their second training session (with a 100% completion rate for both training sessions, a 75% employment rate after the first training session, and a 25% employment rate after the second training session). The remaining 3 participants chose the same vocation in both training sessions (with a 33% completion rate for the first training session and a 100% completion rate for the second training session; a 66% employment rate after the first training session and a 33% employment rate after the second training session). The overall completion rate for the first training session was 71.4%, and the completion rate for the second training session was 100%. The employment rate after the first training session was 71.4%, and the employment rate after the second training session was 28.6%.

**Conclusion:** The study found that repeated participation in vocational training programs among individuals with mental disorders may be related to age, the need for different skills, or a preference for specific vocations. Repeated participation may help to improve the completion rate of training programs but may not necessarily improve employment outcomes.

**Keywords:** individuals with mental disorders, vocational training, repeated participation, employment rate

**Keywords :** individuals with mental disorders, vocational training, repeated participation, employment rate

**Corresponding author :** 黄婉茹

**E-mail :** naugh.wanju@gmail.com

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**Presentation No. :** E\_OTP029

**Submission No. :** 1130165

**Exploring the Roles and Challenges of Occupational Therapists in Community Mental Health Centers in Taiwan**

Wan-Ju Huang<sup>1</sup>

<sup>1</sup> Department of Occupational Therapy, JIANAN PSYCHIATRIC CENTER, MOHW

**Objective:** This study aimed to explore the role positioning, work content, challenges, and professional development needs of occupational therapists (OTs) working in community mental health centers (CMHCs) in Taiwan.

**Method:** A qualitative research design was employed. Semi-structured questionnaires were used to collect data from seven OTs working in CMHCs (with an average of 6.5 years of experience). Thematic analysis was used to analyze the data.

**Results:**

- Roles of OTs: OTs are primarily responsible for client assessment and consultation, leading therapeutic groups, assisting clients with employment, and linking clients to community resources.
  - Work content: OTs' work encompasses mental health promotion, mental illness prevention, case management, and community rehabilitation.
  - Challenges:
    - o The role of OTs is ambiguous, and other professionals lack understanding of occupational therapy, which makes referrals and collaboration difficult.
    - o Resources are insufficient, including human resources, funding, space, and equipment.
    - o Interprofessional collaboration is difficult due to the lack of a communication platform and consensus.
    - o Limited support from supervisors who may not understand or value the occupational therapy profession.
  - Professional development needs:
    - o Enhance professional knowledge and skills, particularly in the field of community mental health.
    - o Expand service models and develop more diverse and innovative service content.
    - o Strengthen interprofessional collaboration by establishing effective communication and collaboration mechanisms.
    - o Advocate for more resources and support, including human resources, funding, and policy support.
- Conclusion:** Occupational therapists in CMHCs play a crucial role in mental health promotion and mental illness prevention in Taiwan, but they face numerous challenges. Future efforts should focus on strengthening professional training for OTs, raising awareness of occupational therapy in society,

establishing interprofessional collaboration models, and advocating for more resources and support to facilitate the development of community mental health services.

**Keywords :** Community Mental Health, Occupational Therapy, Role Challenges

**Corresponding author :** 黃婉茹

**E-mail :** naugh.wanju@gmail.com

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## Health and Well-being

**Presentation No. :** E\_OTs008

**Submission No. :** 1130096

### Impact of Aging Attitudes and Psychological Distress on the caregiving burden of Family Caregivers of Older Adults

陳怡蓉<sup>1</sup> 劉立凡<sup>2</sup> 劉建志<sup>3</sup> 楊宜青<sup>4</sup> 林宗瑩<sup>1</sup>

<sup>1</sup> 成大健照所

<sup>2</sup> 成大老年所

<sup>3</sup> 台南護校通識教育中心

<sup>4</sup> 成大醫院家庭醫學科

**Purpose:** Understanding the factors associated with the burden on family caregivers of older adults is crucial, including their attitudes and beliefs toward aging. There is ample evidence showing the adverse effects of psychological distress on the health and well-being of older adults, as well as the negative impact of ageism on their health, which subsequently leads to increased healthcare costs. However, research focusing ageism on family caregivers remains scarce in this context.

**Methods:** Eligibility for this study required family caregivers currently caring for older adults. Recruitment approaches included two types: online and in-person. Community members were recruited via an online flyer containing a survey link distributed to older adults and their caregivers. In-person recruitment was carried out in inpatient wards and outpatient clinics. Family caregivers (N = 93, mean [SD] age = 69 [7.2]; 51 [54.8%] women) answered survey questionnaires assessing attitudes toward ageing (via Attitude and thoughts Toward Older People Scale), burden (via Zarit Burden Interview), psychological distress (via Depression Anxiety Stress Scale-21), and quality of life (QoL) (via World Health Organization Quality of Life Questionnaire-Brief, WHOQOL-BREF).

**Results:** The caregivers, on average, provided care for 57.89 months (SD = 49.2). Sixty caregivers lived with family members with disability, five reported poor health in the past month, two rated their overall quality of life as very poor, and 11 had ceased working to provide care, affecting their employment. Bivariate correlations indicated that caregivers' self-directed ageism correlated with caregiver burden ( $r = 0.261, p < .001$ ); institutional ageism correlated with caregiver burden ( $r = 0.298, p < .001$ ), physical QoL ( $r = -0.288, p < .001$ ), psychological QoL ( $r = 0.033, p = 0.677$ ), social QoL ( $r = -0.161, p = 0.041$ ), environment QoL ( $r = -0.086, p = 0.277$ ), and psychological distress ( $r = 0.274, p < .001$ ).

**Conclusion:** Family caregivers' ageism significantly associated with caregiving challenges. Future

support and education should emphasize positive caregiving aspects, clarify normal and atypical aging, and dispel negative stereotypes to enhance family caregivers' adaptation and resilience.

**Keywords : caregiver; ageism; burden; psychological distress**

**Corresponding author : 陳怡蓉**

**E-mail : ta8101045@gs.ncku.edu.tw**

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## **Education in Occupational Therapy**

**Presentation No. : E\_OTP030**

**Submission No. : 1130183**

**案例式教學、角色模擬與自我反思於職能治療系大一學生溝通能力之教學效果**

### **Enhancing Clinical Communication Skills in First-Year Occupational Therapy Students through Case Method Teaching, Role-Playing and Self-reflection**

楊哲魁 Yang, Je-Kuei<sup>12</sup> 謝清麟 Hsieh, Ching-Lin<sup>345</sup> 范詩辰 Fan, Shih-Chen<sup>67</sup>

<sup>1</sup>School of Medicine, Chung Shan Medical University

<sup>2</sup> Department of Physical Medicine and Rehabilitation, Chung Shan Medical University Hospital, Taichung, Taiwan

<sup>3</sup> School of Occupational Therapy, College of Medicine, National Taiwan University, Taipei, Taiwan

<sup>4</sup> Department of Physical Medicine and Rehabilitation, National Taiwan University Hospital, Taipei, Taiwan

<sup>5</sup> Department of Occupational Therapy, College of Medical and Health Science, Asia University, Taichung, Taiwan.

<sup>6</sup> Department of Rehabilitation, Occupational Therapy Room, Chung Shan Medical University Hospital, Taichung, Taiwan.

<sup>7</sup> Department of Occupational Therapy, College of Medical Science and Technology, Chung Shan Medical University, Taichung, Taiwan

Effective clinical communication skills are the cornerstone of a occupational therapist's professional competence. Good patient-therapist communication can enhance patient trust, promote patient engagement, and ensure that treatment plans meet patient needs. However, research on the effectiveness of clinical communication skills training is quite limited. This study explores the effectiveness of combining case method teaching, role-playing and self-reflection strategies to improve the communication skills of 20 first-year students. The course included three weeks of case method teaching (CMT) and role-playing, followed by four weeks of field practice.

In the case method teaching, the instructor provided three clinical cases and role-play dialogues. Students were divided into groups of three to analyze real cases, taking turns to play the roles of the therapist, elderly patient, and observer. The observer provided feedback to the students playing the therapist and the elderly patient. This process fostered the students' critical thinking, communication, and group dynamics. During the field practice, students visited a day care center to conduct occupational profiles and complete the Canadian Occupational Performance Measure with elderly

individuals. After the field practice, students completed four self-reflection reports. Students completed a communication skills questionnaire before and after the teaching sessions. The questionnaire was a 5-point Likert scale. After the course, students also completed a course satisfaction questionnaire, also on a 5-point Likert scale. Results showed that the average pre-test score for the communication skills questionnaire was 3.0 (SD = 0.8), and the post-test score was 3.5 (SD = 0.8), indicating significant improvement ( $p < .001$ ). The average score for the course satisfaction questionnaire was 4.31 (SD = 0.75). Qualitative feedback from students' reflection journals included comments such as, "I have changed my perception of elderly patients. I used to think they were rigid and difficult to communicate with, but after the visits, I found their mindset to be very young," and "Interacting more with the elderly has increased my empathy." In conclusion, case method teaching, role-playing and self-reflection effectively could enhance first-year students' clinical communication skills. Future studies should increase the sample size and use randomized controlled trials for further validation.

**Keywords :** communication skills, case method teaching, role-playing, self-reflection, education

**Corresponding author :** 范詩辰

**E-mail :** shihchenfan@gmail.com

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### **Application of Innovative Technology**

**Presentation No. :** E\_OTP031

**Submission No. :** 1130054

**Site effects of combining non-invasive brain stimulation with mirror therapy on motor functions post-stroke**

吳菁宜<sup>1</sup> 蘇耿賢<sup>1</sup> 廖婉玢<sup>2</sup> 林佳宜<sup>3</sup>

<sup>1</sup> 長庚大學

<sup>2</sup> 國立臺北護理健康大學

<sup>3</sup> 臺大醫院新竹分院

**Introduction :** Mirror therapy (MT) has been demonstrated to improve the motor function of the paretic upper extremity (UE) in stroke patients. Transcranial direct current stimulation (tDCS), a non-invasive brain stimulation technique, can enhance the effects of MT. The primary motor cortex (M1) has been a tDCS target for being the main motor output site. However, M1 would be damaged in the infraction or hemorrhage of the middle cerebral artery, which is highly prevalent in stroke populations. The premotor cortex (PMC) could be an alternative tDCS site for its essential role in motor learning/planning and for its being less affected by stroke.

**Objectives :** This study aims to investigate the effects of tDCS at PMC versus M1 combined with MT on motor functions in chronic stroke.

**Method :** This study was a double-blinded, randomized controlled trial. Thirty-three chronic stroke patients were randomly assigned to one of three groups (PMC, M1, or Sham). All participants



received 20 intervention sessions (90 min/session, 3-5 sessions/week). Clinical assessments were performed before and after interventions to evaluate changes in motor functions. Outcome measures were motor impairment by the Fugl-Meyer Assessment Scale-UE (FMA-UE), grip and lateral pinch strength by the Jamar Hydraulic Hand Dynamometer, and UE motor ability by the Wolf Motor Function Test (WMFT). Mixed ANOVA was conducted to analyze the effects regarding group, time, and their interaction.

**Results** : A significant interaction effect was shown in the grip outcome ( $F_{2,30}=4.23, p<.05$ ). The post hoc analysis showed significant improvements after intervention exclusively in the PMC group but not in the other groups. For the rest of the outcomes, only significant time effects were demonstrated in the FMA-UE ( $F_{1,30}=26.59, p<.05$ ), lateral pinch ( $F_{1,30}=4.44, p<.05$ ), bimanual grip ( $F_{1,30}=12.37, p<.05$ ), and WMFT-functional ability scale (FAS) ( $F_{1,30}=20.61, p<.05$ ). The post hoc analysis showed different improvements for the three groups. The TMC group exhibited significant improvement in FMA-UE ( $p<.05$ ), grip ( $p<.05$ ), bimanual grip ( $p<.05$ ), and WMFT-FAS ( $p<.05$ ). The M1 group exhibited significant and marginal improvement in FMA-UE ( $p<.05$ ), lateral pinch ( $p<.05$ ), bimanual lateral pinch ( $p<.06$ ), and WMFT-FAS ( $p<.05$ ). The Sham group only exhibited significant improvement in FMA-UE ( $p<.05$ ).

**Conclusion** : Our results support the advantage of either PMC or M1 tDCS with MT in improving motor functions in chronic stroke. Applying tDCS on different sites exhibited different effects. Applying PMC tDCS with MT seems more beneficial for enhancing the grip of the paretic or bilateral UE, while M1 tDCS with MT appears to be more effective in improving the lateral pinch of the paretic or bilateral UE. Both tDCS protocols can improve motor impairment and motor ability of the paretic UE for stroke patients. The combined mode of tDCS at PMC and M1 with MT to facilitate motor functions should be considered in future clinical applications.

**Keywords** : Stroke, transcranial direct current stimulation, premotor cortex, primary cortex, mirror therapy

**Corresponding author** : 吳菁宜

**E-mail** : cywu@mail.cgu.edu.tw

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**Presentation No.** : E\_OTP032

**Submission No.** : 1130055

**The therapeutic effects of mirror therapy sequentially combined with robot-assisted therapy on motor and daily function and self-efficacy in stroke**

吳菁宜<sup>1</sup> 陳彥維<sup>2</sup> 蘇耿賢<sup>1</sup>

<sup>1</sup> 長庚大學

<sup>2</sup> 亞洲大學

**Introduction** : Robot-assisted therapy promotes upper limb function in stroke survivors through intense, repetitive practice. Mirror therapy improves motor function of the upper limb after stroke by mirror-induced visual illusion to facilitate neuroplasticity. Combining these two interventions might

yield greater therapeutic effects.

**Objectives** : We aimed to examine whether mirror therapy would augment the therapeutic effects of robot-assisted therapy on motor function, daily function, and self-efficacy in chronic stroke survivors.

**Materials & methods** : A single-blinded randomized controlled trial was conducted in this study. Thirty-seven individuals with chronic stroke were randomly assigned to the experimental group receiving mirror therapy prior to robot-assisted therapy and the control group receiving sham mirror therapy prior to robot-assisted therapy during an intervention session. All participants received 18 intervention sessions (60 min/session, 3 sessions/ week). Outcome measures were evaluated at baseline and after the 18-session intervention. Motor function was assessed using the Fugl-Meyer Assessment. The daily function was assessed using the Nottingham Extended Activities of Daily Living Scale. Self-efficacy was assessed using Stroke Self-Efficacy Questionnaires and the Daily Living Self-Efficacy Scale. Data was analyzed using mixed model analysis of variance.

**Results** : Both groups showed significant improvements in motor and daily function, but there were no significant differences between the two groups. Participants receiving mirror therapy prior to robot-assisted therapy experienced greater improvements in self-efficacy measures compared to those receiving sham mirror therapy.

**Conclusion** : Our findings suggest that robot-assisted therapy improved upper limb function and daily independence in chronic stroke survivors. Combining mirror therapy with robot-assisted therapy could further enhance self-efficacy post-stroke.

**Keywords** : stroke, robot-assisted therapy, mirror therapy, combination

**Corresponding author** : 吳菁宜

**E-mail** : cywu@mail.cgu.edu.tw

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**Presentation No.** : E\_OTP033

**Submission No.** : 1130141

電子化旋轉後眼球震顫測驗設備開發與信效度建立

**The reliability and validity study of motorized post-rotary nystagmus test**

Shao-Hsia Chang<sup>1</sup> Nan-Ying Yu<sup>2</sup> Rong-Ching Wu<sup>3</sup> Shang-Ting Su<sup>1</sup>

<sup>1</sup> Department of Occupational Therapy, I-Shou University

<sup>2</sup> Department of Physical Therapy, I-Shou University

<sup>3</sup> Department of Electrical Engineering, I-Shou University

**ABSTRACT** : Research background and purpose: A valid assessment result depends on accurate processes and good reliability and validity. Post-rotary nystagmus test is a physiological indicator commonly used in occupational therapy to evaluate children's sensory integration and vestibular function. The traditional assessment process requires manual rotation at a constant speed (one revolution every 2 seconds, 30 rpm) for ten revolutions and then the observation of nystagmus. However, during the rotation process, it is often difficult to control the rotation speed and the same

speed throughout the process due to the weight of the child and the difference in rotation tools. It is usually impossible to control the stimulation intensity of the entire rotation process, which affects the evaluation results.

**Methods:** A rotating test table was developed in this study. The table size is 35 cm high and 80 cm in diameter. The table includes upper cover, iron plate and base. The base includes mechanism, motor, power supply, driver and microprocessor controller. The examiners can use their smartphones to control the rotating test table, can set different rotation speeds, and can choose the rotation direction. Under a load of 80 kg, the rotating test table can reach the set speed in 2.0 seconds.

**Preliminary study on reliability and validity:** This study recruited 22 subjects and recorded the post-rotary nystagmus period. Different speeds (normal speed and slow speed, 30 RPM and 15 RPM respectively), rotation modes (electric and manual), and directionalities (clockwise and counterclockwise) were applied as control variables. After each rotation test, the nystagmus was videotaped for further analysis. In addition, to test the test-retest reliability, each subject received clockwise and counterclockwise assessments on the same day. The testing order of rotation direction was counterbalanced in the 22 subjects.

**Research results:** A total of 22 subjects participated in the experiment completed the tests. The average age was 21 years old. The average nystagmus duration of normal speed rotation was 14.37 (sd=3.43) seconds, the average of slow rotation was 11.26 (sd=2.55) seconds, and the average of manual rotation test was 11.02 (sd=3.02) seconds. ANOVA was used to test the mean differences among the three protocols. The results showed that there was a significant difference between the protocols ( $F=26.494$ ,  $p<.001$ ). The nystagmus duration of the normal speed test was significantly longer than that of the slow rotation test ( $p<.001$ ) and manual rotation test ( $p<.001$ ).

In the test-retest reliability test, the same subjects were tested for clockwise and counterclockwise rotation at normal speed. The mean difference was  $-.25$  (sd=2.20) seconds ( $p=0.440$ ), and the correlation coefficient was  $.86$  ( $p<.001$ ).

**Conclusion:** This study found that a motor-driven rotary platform can provide quantitative vestibular stimulation. In such a standardized rotary platform, the post-rotary nystagmus test is more reliable and valid when compared with a manually propulsive platform.

**Keywords :** post-rotary nystagmus, precision measure, validity, reliability

**Corresponding author :** 張韶霞

**E-mail :** stacey12@isu.edu.tw

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**Presentation No. :** E\_OTP034

**Submission No. :** 1130097

探索 BDNF 基因型對中風復健中大腦功能性連接性的影響：一項前驅研究

**Unravelling the Impact of BDNF Genotype on Functional Brain Connectivity in Stroke**

**Rehabilitation: a pilot study**

Chia-Lun Liu<sup>1</sup> Wei-Hsien Chien<sup>2</sup> Ju Yen Huang<sup>3</sup> Ching-Yi Wu<sup>1</sup>

<sup>1</sup> Department of Occupational Therapy, Chang Gung University

<sup>2</sup> Department of Occupational Therapy, Fu Jen Catholic University

<sup>3</sup> Early Intervention Center, Taipei hospital

**Background:** Neuroplasticity is crucial for stroke rehabilitation, and brain-derived neurotrophic factor (BDNF) provides the key biological foundation for forming new connections between neurons, supporting recovery. It has been found that BDNF can predict upper extremity outcomes three months after a stroke (Hyuk et al., 2017). Despite the association between physical outcomes and BDNF, the exact mechanisms remain largely unknown. Recent developments in neuroscience have employed network-based approaches to examine the rehabilitation process (Latifi & Carmichael, 2024). Notably, graph theory, a mathematical approach, has been used to describe changes in functional connectivity using different graph metrics during recovery after a stroke. Therefore, we hypothesized that BDNF would affect the formation of brain networks, reflected in graph-related metrics. We predicted that genotype would affect functional connectivity differently, particularly in the damaged hemisphere.

**Method:** 20 chronic stroke patients with mild cognitive impairment were classified by BDNF genotype: Val/Val (n=5), Val/Met (n=13), or Met (n=2). They underwent pre- and post-treatment assessments and engaged in exercise-cognitive training for 60 minutes/day, 3 days/week, over 12 weeks. EEGs were recorded during a cognitive task, and physical outcomes, such as the upper limb Fugl-Meyer assessment (FMA-UE) and Rivermead Mobility Index (RMI), were also measured. EEG preprocessing was done using custom EEGLAB scripts, and graph metrics were analysed with the Brain Connectivity Toolbox. Functional coupling was computed for theta (4-8 Hz), alpha (8-12 Hz), and beta (13-30 Hz) frequency bands, focusing on global and local metrics in the damaged hemisphere (F3/F4). A mixed-ANOVA with Genotype (Val/Val, Val/Met, Met) and Time (pre vs. post) was separately applied to each combination of graph metrics and frequency bands.

**Results:** There was a significant interaction in FMA ( $p < .01$ ), primarily driven by elevated FMA scores in both Val/Val ( $p = .01$ ) and Met ( $p < .01$ ) groups. For RMI, a marginal Time effect was detected ( $p = .08$ ). Regarding graph metrics, the results showed a significant interaction in global efficiency ( $p = .04$ ) and degree ( $p = .01$ ) at the alpha band. Follow-up post-hoc analysis revealed a reduced degree in the Val/Met group after training. Although other post-hoc results were not significant, all genotypes showed a decreasing trend. Additionally, there was a significant main effect of Time on local efficiency ( $p = .02$ ) and betweenness centrality ( $p < .01$ ) at the theta band. Post-hoc analysis of local efficiency showed no significant difference after training, but a trend of reduced values across all genotypes. Conversely, betweenness centrality showed a non-significant trend of increasing values in all groups.

**Discussion:** The reduced global efficiency may indicate a modular process, where the frontal lobe decreases its integration of information from distributed brain regions after training. Similarly, local efficiency-related metrics, including degree and betweenness centrality, showed a declining trend post-training, suggesting that the frontal network initially forms several connections but gradually

trims irrelevant ones during training. This study highlights the use of graph theory in understanding functional changes during rehabilitation concerning genotypes and may provide insights into personalized stroke treatments.

**Keywords :** BDNF genotype, Stroke Rehabilitation, graph theory, EEG

**Corresponding author :** 劉嘉倫

**E-mail :** d000019299@cgu.edu.tw

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## **Occupational Theory and Clinical Practice**

**Presentation No. :** E\_OTP035

**Submission No. :** 1130156

探索成人的遊戲經驗

**Do you play? Exploring Adult Play Experience**

Megan Chang<sup>1</sup> Erna Blanche<sup>2</sup> Diane Parham<sup>3</sup>

<sup>1</sup> San Jose State University

<sup>2</sup> University of Southern California

<sup>3</sup> University of New Mexico

**Background:** Play has been viewed as a critical occupation supporting health since the founding of occupational therapy, but the complexity of play presents challenges to scholars who study adults. Researchers in occupational science and occupational therapy often address the experiential qualities of occupations, including those considered to be play. However, the literature lacks clear descriptions of what constitutes adult play and the experiences of adults during preferred activities. We refer to these activities as adult play because they contain experiential qualities of play described in key play literature.

**Methods:** This is a cross-sectional survey study. A 31-item survey, the Daily Occupational Experience Survey–revised (DOESr), was uploaded to Qualtrics for data collection. Snowball sampling was used to recruit participants aged 18–64. Exploratory factor analysis was used to extract the most prevalent patterns of play experiences reported. Internal consistency and content validity were also examined.

**Results:** 491 participants completed the survey. The factor analysis yielded an optimal solution of five factors representing distinct patterns of adult play experiences: Creativity–Adventure, Restoration, Deep Engagement, Ludos, and Mastery.

**Conclusions:** The five factors identified by the DOESr represent distinct patterns of adult play experiences. The DOESr demonstrated acceptable internal consistency for three factors and the overall tool.

**Keywords :** Occupation, Play, Evaluation and Assessment

**Corresponding author :** Megan Chang

**E-mail :** megan.chang@sjsu.edu

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**Presentation No. : E\_OT009**

**Submission No. : 1130136**

**認知訓練對重度憂鬱症成人的有效性：統合分析**

## **The Effectiveness of Cognitive Training in Adults with Major Depressive Disorder: A Meta-Analysis**

利家蓉<sup>1</sup> 李秉家<sup>1</sup> 歐雅雯<sup>2,3</sup>

<sup>1</sup> 義守大學職能治療學系

<sup>2</sup> 輔大醫院護理部

<sup>3</sup> 輔仁大學護理系

### **Abstract :**

**Purpose :** Cognitive training (CT) has been increasingly explored as a therapeutic intervention for improving cognitive functions and reducing depressive symptoms in adults with Major Depressive Disorder (MDD). This meta-analysis aims to evaluate the effectiveness of CT compared to placebo or other treatments in enhancing cognitive functions and alleviating depressive symptoms in this population. By employing a meta-analysis approach, this study synthesizes the existing evidence on the impact of CT in adults with MDD.

**Method :** A comprehensive search was conducted in PubMed, Embase, and Cochrane databases up to July 2024 to identify studies on cognitive therapy for MDD patients. The inclusion criteria were randomized controlled trials (RCTs) with a clinically defined current or lifetime history of MDD, using established criteria such as the Diagnostic and Statistical Manual of Mental Disorders 5th edition guidelines (DSM-5). Given the variability in medication use, dosage, and baseline risk among participants, a random-effects model was employed to pool the included studies. The meta-analysis was performed using R, and the quality of evidence was assessed using the GRADE framework.

**Results :** A total of 21 RCTs involving 1007 participants were included. The meta-analysis revealed that cognitive training had a modest but significant effect on reducing depressive symptoms (Hedge's  $g = 0.25$ ,  $I^2 = 69.2\%$ , 95% CI [0.03, 0.48]). Additionally, significant improvements were observed in executive function (Hedge's  $g = 0.45$ ,  $I^2 = 42.31\%$ , 95% CI [0.26, 0.63]), and working memory (Hedge's  $g = 0.38$ ,  $I^2 = 71.14\%$ , 95% CI [0.11, 0.65]). However, the effect on verbal learning was less conclusive due to high heterogeneity (Hedge's  $g = 0.64$ ,  $I^2 = 93.86\%$ , 95% CI [-0.01, 1.30]).

**Conclusions :** According to the best available evidence, cognitive therapy for patients with Major Depressive Disorder (MDD) demonstrates statistically significant effects. MDD is a debilitating condition that significantly impairs cognitive functions and daily living activities. Cognitive training (CT) has emerged as a valuable intervention for enhancing cognitive abilities and alleviating depressive symptoms in adults with MDD, highlighting its potential as a complementary treatment in clinical practice. The results of this study underscore the effectiveness of CT in improving executive function and working memory, supporting the holistic approach of occupational therapy in addressing both cognitive and emotional aspects of MDD. As professional occupational therapy managers, we recognize the importance of integrating CT into clinical practice to enhance

therapeutic outcomes for individuals with MDD, and encourage occupational therapists to consider CT as a viable option for improving cognitive and emotional well-being in patients.

**Keywords :** Cognitive Training 、 Major Depressive Disorder 、 Occupational Therapy 、

**Meta-Analysis**

**Corresponding author :** 利家蓉

**E-mail :** eck12964@yahoo.com

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**Others: OT in ICU**

**Presentation No. :** E\_OT010

**Submission No. :** 1130188

**腎臟損傷重症患者譫妄症之神經電生理特性:事件相關電位研究**

**Electrophysiological characteristics of delirium in critical care patients with renal dysfunction:**

**An event-related potential study**

陳怡倩<sup>1</sup> 張懷仁<sup>2</sup> 張靖玟<sup>1</sup> 李佳玲<sup>1</sup> 呂昕潔<sup>3</sup> 鄭嘉雄<sup>3</sup>

<sup>1</sup> 衛生福利部桃園醫院職能治療科

<sup>2</sup> 衛生福利部桃園醫院重症醫學科暨神經重症科

<sup>3</sup> 長庚大學職能治療學系

**Background:** Delirium is a prevalent and severe complication in critically ill patients, often associated with increased mortality, prolonged ICU stays, and cognitive decline. The pathophysiological mechanisms underlying delirium are not fully understood and can be associated with a variety of diagnoses. Current diagnostic tools, such as the CAM-ICU, have limitations, particularly in patients who are sedated or comatose, making accurate and timely identification of delirium challenging. Mismatch negativity (MMN) is an electrophysiological indicator that reflects the brain's functional integrity of sensory memory and involuntary attention switching. It offers objective and quantifiable assessments of neural processing and is sensitive to various cognitive and neurological conditions, making it a valuable tool for evaluating brain function in critically ill patients. Thus, the present study aimed to examine the electrophysiological characteristics, as indexed by MMN, in ICU patients with and without delirium. Furthermore, the relationship between the severity of delirium and MMN responses were explored.

**Methods:** Since patients with renal-related conditions have been reported to be at a higher risk of developing delirium, we recruited ICU patients with renal dysfunction who were hemodynamically stable and monitored for delirium. Subjects were assigned to either the delirium (n = 14, age 71.8 ± 2.3 years) or non-delirium (n = 13, age 62.5 ± 3.6 years) group based on CAM-ICU results. MMN recordings and Confusion Assessment Method-Severity (CAM-S) were conducted within 24 hours of ICU admission using an auditory oddball paradigm. This paradigm involved presenting a sequence of frequent 'standard' auditory stimuli interspersed with infrequent 'deviant' stimuli, designed to elicit the MMN response. All ICU patients were monitored twice daily until discharge. Due to the fluctuating nature of delirium, subjects were allocated to the non-delirium group only if they had no

history of positive results from the CAM-ICU. Thirteen healthy adults were also recruited as the controlled group. The parametric analyses were applied when the data were normally distributed; otherwise, non-parametric analyses were utilized.

**Results:** ICU patients had significantly smaller MMN peak amplitudes compared to healthy controls ( $p = 0.017$ ). Additionally, delirious patients showed significantly prolonged MMN peak latency compared to non-delirium patients ( $p = 0.005$ ). It was also interesting to note that the MMN peak latencies were positively correlated with the scores of CAM-S across all the ICU patients ( $r = 0.369$ ,  $p = 0.029$ ), suggesting that more severity of delirium was associated with slower information processing in the brain.

**Conclusions:** Aberrant MMN responses were clearly observed during episodes of delirium in ICU patients. Our data provided an in-depth understanding of the impact of delirium on the brain function.

**Keywords :** delirium, intensive care unit, renal dysfunction, mismatch negativity (MMN)

**Corresponding author :** 鄭嘉雄

**E-mail :** [ch.cheng@mail.cgu.edu.tw](mailto:ch.cheng@mail.cgu.edu.tw)

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